

EDDY AWARDS

MacUser Presents the Top 40 Products of the Year

6 CD-ROM Drives Go Head to Head

Guy Kawasaki New Columnist Tells All

SCSI Accelerators
Up to Speed?

3-D Shoot-out Swivel 3D vs. Super 3D

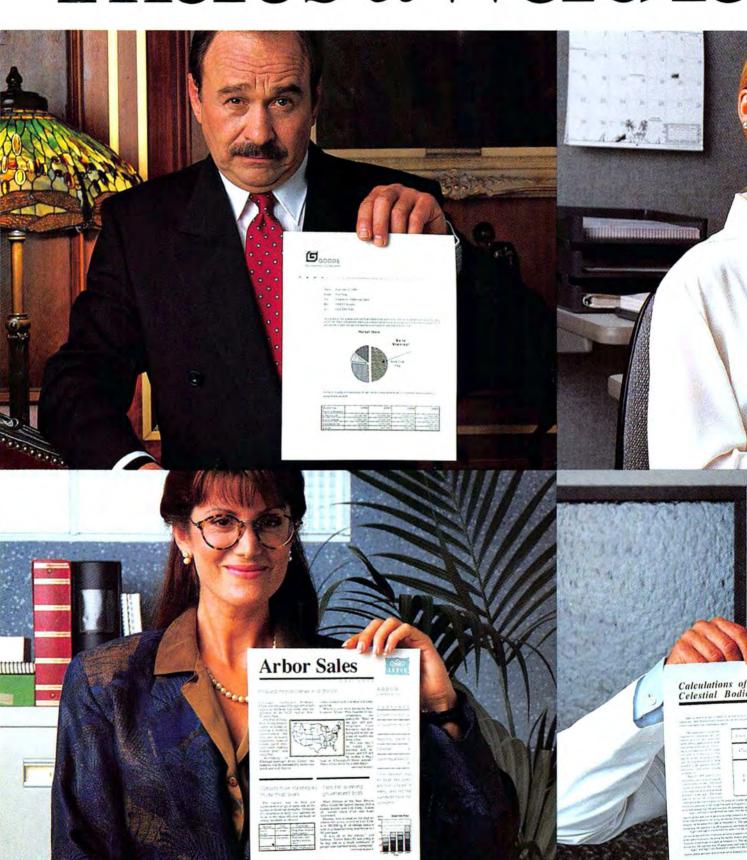
> PageMaker 4.0 The First Peek

On-Line Breakthroughs
America Online and
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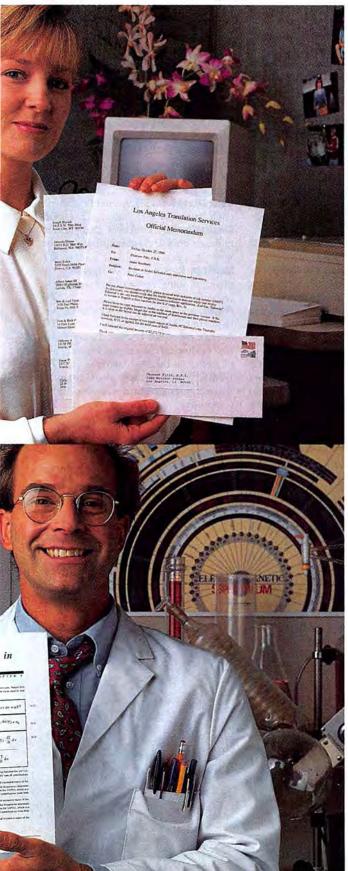
Hot Product Reviews



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For technical terms, read *Inside Macintosh*. But for the *business* side of the Apple/Macintosh vocabulary, turn to Guy Kawasaki — he's got some words for the would-be wise. Plus a first peek at the newest version of PageMaker, news, rumors, reviews of the hottest new products, upgrades of old favorites, and more.

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BY STEVEN BOBKER

Phone Line Manager 103: A way to avoid the expense of additional phone lines.

Macintosh Portable: The greatest portable/ laptop ever made, but it's still a long way from being perfect.

Baker's Dozen: A shareware solitaire game. **Moriarty's Revenge:** Learn some geography while having some fun.

INIThound: An INIT that examines other INITs.

SuperANOVA: A slick, complete general-linear-modeling program.

Letterforms & Illusion: Visual puzzles, images, and games that help you learn about words and type.

Preditor: A good, solid text editor for programmers.

The FileMaker Report: A newsletter for FileMaker users.

Perceive: A music-education program aimed at schools.

Paradigm: Adds new relational drawing abilities to the basic drawing package.

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BY ROBERT R. WIGGINS

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Special Report



Fifth Annual MacUser Editors' Choice Awards

BY THE EDITORS OF

MACUSER

Our annual salute to the best new Macintosh hardware and software is bigger (and the products better) than ever before. After surveying a strong field of contenders, we picked the winners and runners-up in more than 40

categories, including Most Significant Hardware, Most Significant Software, and Best New Technology of the Year. Find out which of 1989's new offerings made the grade. Plus, the debut of two awards in honor of individuals who made a difference.

Features

To the Rescue

BY LEONARD HINDUS

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Power Tools

Directory Assistance

BY ROSS SCOTT RUBIN

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AND KURT W. G. MATTHIES

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BY GREGORY WASSON

On the LaserWriter, not all gray scales are created equal. Different applications produce different results, and they're not always the best the printer can do. Here's a PostScript fix.235

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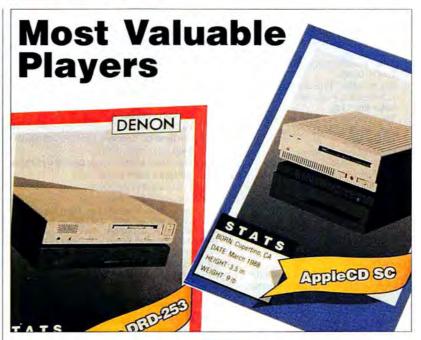
BY DAVE VALIULIS

The Zapf Dingbats font has some startling omissions and oddities, but the solutions are easy. 236

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MacUser Labs





BY JOHN RIZZO AND THE MACUSER LABS STAFF

Megabyte for megabyte, CD-ROM discs offer the cheapest way to distribute large quantities of data - up to 650 megabytes on a single disc. But because CD-ROM drives are inherently slower than hard disks, getting a relatively fast one is all the more important. We tested six current models to discover the speed king. 150

Labs Brief: SCSI Accelerators

BY TIM STANDING, PAUL YI, AND THE MACUSER LABS STAFF

Everyone hates to wait. SCSI accelerators attempt to decrease the wait by increasing the speed of the SCSI data path. Are any of these NuBus boards a valuable addition

to the average Mac II user's equipment arsenal? After extensive real-world testing, MacUser Labs uncovered some startling results.175

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Product Announcements and Updates

MacUseris always looking for new and unusual products for our StartUp, Power Tools, Bridges, and DTP sections, as well as for feature coverage. If you've got a product that you'd like to tell us about — whether it's new or an upgrade—send your letters or press releases to Michele Stokol, Editorial Assistant, MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Technical Difficulties and Help

Technical Difficulties and Help Although we can't offer any telephone assistance, MacUser welcomes your technical questions. If you've got a Mac question or problem, send it to Help Folder, clo MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. If we can't give you an answer, we'll find someone who can. Because of the volume of mail we receive, we can't answer all your questions, so we also recommend that you take advantage of your local user groups. You can find the one nearest you by calling Apple toll-free at (800) 538-9696, ext. 500.

Tips, Hints, and Programs

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Writing for macuser

If you have an idea for an article you'd like to write, we'd like to read it. Send a query letter with samples of your writing (published if possible) and some information about your background to Jon Zilber, Executive Editor, MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. No calls please. Since we rarely buy unsolicited manuscripts, save your-self some work and don't send us a completed article without writing first. Please allow four to six weeks for a reply.

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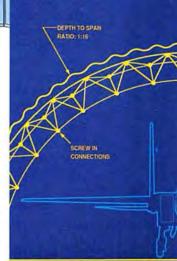
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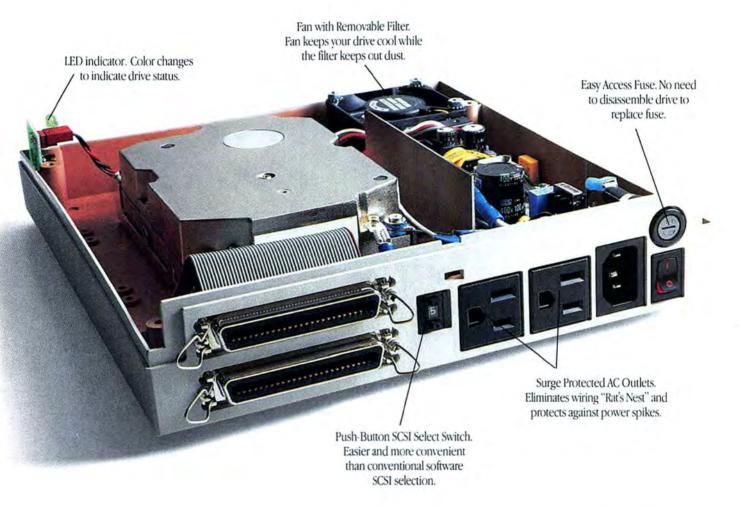
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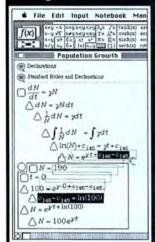


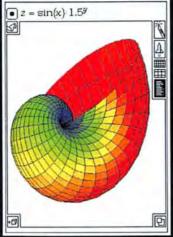
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The Golden Guys

Who's shorter than Andy Hertzfeld, weighs less than *Inside Macintosh*, and started hefting a Mac long before the Portable was even a glint in Jean-Louis' earring? *MacUser*'s Eddy, of course.

The solid bronze symbol of *MacUser's* annual Editors' Choice Awards may not be as widely known as his distant cousins Oscar, Emmy, and Tony, but when the winners are announced at our gala ceremony, the nominees' hearts pound

just as audibly. Just page through the advertisements in *MacUser* (or any other Mac magazine, for that matter) to see how proud past and present recipients are of their Eddies.

1990 marks the fifth year that MacUser's editors have singled out the best new products for the Mac, and plenty has changed since January 1986 — for both the Mac community and its most prestigious award. When Eddy debuted, it wasn't clear whether he was a she or a he. Not until a real statue was sculpted by noted Mac artist Mike Saenz the next year was the issue resolved.



Eddy and friend: Two men of mettle.

And not until those first statues arrived did we realize that the figure needed a name. Fortunately, no one could agree on how to spell Maccie (Maccy? Mackie?), so Eddy carried the day.

Since then, Eddy has changed little outwardly, though he finally traded up to an SE in 1989 (long after the rest of the *MacUser* office had done so). The awards he represents, however, have had to keep pace with a fast-growing and constantly evolving market.

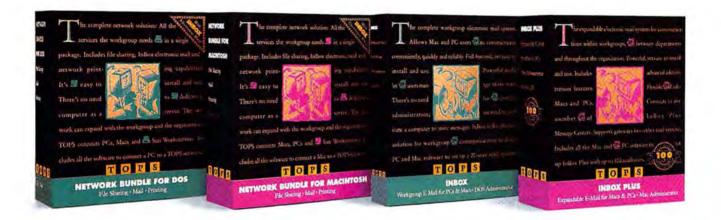
Back in 1986, we recognized just 22 categories — all of them for software products. This year, we're recognizing 40 categories in both software and hardware. In addition, this year we introduce two special Eddies that will be awarded to individuals in the Mac community. One recognizes distinguished achievement; the other salutes a rising star.

So look for the man with the Mac in his hands — he's *MacUser*'s symbol of quality, innovation, and excellence.

NEW GUY IN TOWN

This issue of MacUser sees some important changes. Long-time contributing editor Jim Seymour is leaving us after many months of insightful analysis. We'll miss his unique perspective on the Mac. At the same time, we're delighted to welcome a new columnist and contributor who has a distinctly personal outlook on the Mac—Guy Kawasaki. This former Mac evangelist, exsoftware CEO of ACIUS, and current best-selling author will share his thoughts on the Macintosh Way every month—both in a regular column and with regular excerpts of the world according to Guy that will add a little irreverence to our Start-Up section. Watch out, Dvorak!

Four reasons why 1990 will be the year of the workgroup.



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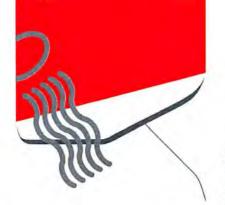
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LETTERS

Japanese reader Tetsuva Ishikawa writes that he was "surprised at 'To John Sculley from Japanese Macintosh Users' (December '89, pages 106 and 107), I wonder why MacUser's editors quoted the article in Japanese instead of English? I don't think U.S. readers do understand the article." In case anyone else was confused, the "article" was an eye-catching-butenigmatic advertisement by Pascal, a Japanese distributor. Tetsuya's right, though: We've haven't a clue as to what it says. We do have it on good faith, though, that it's no more litigious than the rest of the magazine.

WRITE TO

Letters to the Editor, c/o *MacUser* 950 Tower Lane 18th Floor Foster City, CA 94404

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COMPILED BY JAMES BRADBURY

ATM: PostScript, not Posthaste

Adobe Type Manager (ATM) made my Mac Plus slower than a Commodore 64, even after I adjusted the RAM cache per Adobe's manual. In Ready,Set,Go! 4.5, for example, the screen scrolls like molasses, and it takes 90 seconds or more for text to change after I select a new type size or font. Worse yet, whenever I try to send documents to the Desk Writer, I get an error message telling me my printer is out of memory after only half a page has printed.



What gives? Although Adobe advertises compatibility with only a minimum Mac Plus, is it possible that I have to upgrade to 2 megabytes of memory in order to use ATM?

Marcy Poulos Grand Rapids, MI

Unfortunately, compatible as used by software publishers doesn't always translate to practical as used by software purchasers. As our February '90 review of ATM indicated, the program is very slow on 68000-based Macs and uses 200K of RAM, which severely limits its usefulness for owners of 1-megabyte machines.

— JB

Truth in Typesetting

MacUser's December '89 issue carries an ad for Adobe Type Manager. The ad shows "unretouched photographs" of a Mac Plus running Word 4.0 and an ImageWriter printing out the document.

I purchased ATM, installed it on my Mac Plus, launched Word 4.0, and entered the same text displayed in the advertisement. My results did not match the ad's nicely spaced type.

This very effective advertisement purports to show that ATM is compatible with low-level hardware configurations and standard word-processing programs. I would appreciate it if you could ask Adobe to explain how this misleading ad was really prepared. I don't know how many others fell into the trap of buying ATM only to find out that what they saw

was definitely not what they got.

Jacob Shekel Brookline, MA

Hold that call to David Horowitz. You're right about its being Word 4.0 in the advertisement, but you're wrong about the impossibility of reproducing the onscreen display. How did Adobe do it? By applying the Condensed Spacing option in the Edit Character dialog box.— JB

Instant Font Access

In "Hot Type: Rising Font Wars" (StartUp, December '89), James Bradbury mentioned that ATM won't work unless you have the outline version of the font in your System folder. The shareware DA SetPaths lets you access printer fonts from a single drive on a network. I find it extremely convenient to put certain fonts into the same folder as the job they are needed for and to open the SetPaths DA to make the necessary path for ATM to work.

Al Telles Lakeside, CA

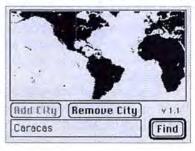
Thanks for the tip. SetPaths is available from its author, Paul Snively, at 3519 Park Lodge Court, Apt. E, Indianapolis, IN 46205; (317) 253-5970. The shareware fee is \$20. — JB

Apple's Geography Lesson

Here in Venezuela, the mentality is 99percent MS-DOS, although I'm doing my part to change that. Recently, however, I wrote to Apple about some problems I was having with my Mac SE. Its response was to tell me to contact my local dealer in Buenos Aires, Argentina. I wrote back explaining that Venezuela is a good deal closer to Florida than to Argentina, not to mention cheaper to get to. Does Apple have any intention of being serious in Latin America (and buying a world atlas)?

Alfredo J. Dominguez Caracas, Venezuela

Apple needs no atlas — the Map cdev now comes with every Mac. A quick check



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Guy Kawasaki, President of ACIUS, developers of 4th dimension

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June 1989 tttt

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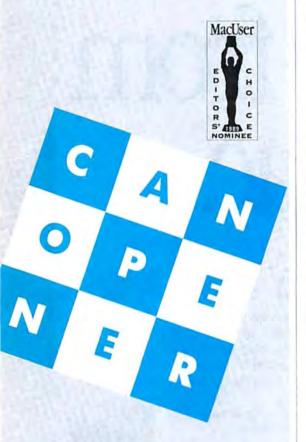
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with Apple's Map reveals that Miami (1,370 miles) is indeed closer to Caracas than Buenos Aires (3,170 miles) is. But, then, so are New Orleans (2,010 miles), Chicago (2,510 miles), and Fargo, North Dakota (3,060 miles). But you are closer to Buenos Aires than you are to Cupertino (3,870 miles). — JB

This Mouse Condemned

I enjoyed Ken Landis' review of nonrelational, or flat-file, databases ("In Single File" November '89). One statement regarding FileMaker II, however, is erroneous. Although FileMaker II's documentation and your article both state that the size of a file is limited only by the size of the disk drive, this is not the case. A bug in the software cripples the mouse after 32,768 (2¹⁵) records. If you use the mouse to try to edit or select a field in a record past that number, FileMaker kicks you back to the first record in the file.

I called Claris and explained the situation, and it stated that there were no plans to fix this bug. So buyers beware: If you need to keep a file of more than 32,767 records, FileMaker II may not be the program for you.

Kevin S. Cummings Urbana, IL

A Claris spokesman confirmed that the company "has documented the bug and will fix it but can't commit to any specific schedule for that as of yet." — RI

Smarter, Better Software

I agree with Paul Somerson ("Software to Watch Over Me," July '89) that better, more intelligent software is the best thing that could happen to computers (even the Mac). The Mac is good, but the software is going to have to be awesome. You or me or any host of Apple dealers won't be able to talk people into buying machines (and shouldn't have to). It will be the software itself that determines whether or not people can benefit from computers.

Eric Rick Olala, FL

Shareware from Elsewhere

I was surprised to read the "50 Best Shareware" article (December '89), listing BMUG (Berkeley Macintosh User's Group) as the only source of Macintosh public-domain and shareware software. No mention was made of the hundreds of other user groups around the country that provide shareware and public-domain

programs.

One such user group is the Boston Computer Society Macintosh Group (BCS·Mac). the world's largest nonprofit Macintosh user group, with more than 12,000 members. BCS.Mac has an extensive, high-quality virus-free, softwareexchange library, with more than 100 disks priced at \$4 each for members. Most of the 50 programs men-

tioned in the article are also available from BCS•Mac.

Jonathan Carpenter Boston Computer Society Somerville, MA

BCS•Mac also sells one of the best public-domain CD-ROM collections we've seen: PD-CD4.0, which costs \$125. For more information, contact it at 48 Grove St., Somerville, MA 02144; (617) 625-7080. Both BCS and BMUG have international membership. To find out how to contact the user group nearest you, call (800) 538-9696, ext. 500. — JB

Macintosh Technical Notes



Developer Technical Support

#31: The Dogcow

Old Dogma, New Tricks

Robert Wiggins directed the brunt of the blame for recent Mac-interface violations toward programmers (December '89). Surprisingly, he places little blame on Apple. The consistent interface that made the Mac what it is today is due entirely to Apple's dogma, but where is that dogma now?

Apple has given programmers fullcolor capabilities, pop-up menus, and a myriad of other goodies but has in no way specified how to use them. Adding to this confusion, Apple supports HyperCard an application that is the epitome of Macinterface violation — as "official system software."

Philip and Dimitri Zarboulas Daly City, CA

Alas, Apple's Developer Technical Support has eschewed the dogma in fav-

or of the dogcow. Of course, Apple is

Mass terpiece

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The pages shown above were created with Adobe Illustrator. and Aldus. PageMaker. Color Extension on a Mac II, and printed with Freedom of Press on a Seiko. CH-5504

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allowed to break the rules. After all, it stole them in the first place. - RW

Bill's Due

I was thrilled to see Bill's Dingbats, a PostScript-compatible font I designed for the Macintosh in 1986, included in your "50 Best Shareware" article (December '89). Thrilled—and somewhat dismayed. A couple of years ago, I left a shareware version of Bill's Dingbats with its accompanying documentation and a request for an \$8 shareware fee on GEnie and CompuServe. Hundreds of people have downloaded the font, and it has since appeared in many shareware catalogs and user-group libraries. I have seen symbols from the set used in publications nationwide. To date, though, only 23 people have returned the \$8 shareware fee.

I'm glad that Bill's Dingbats has been of use to so many people. Could you let your readers know that I created the font and that it was made available to the shareware community by U-Design Type Foundry, 201 Ann St., Hartford, CT (in case anyone has lost the address of where to send the \$8)?

Bill Tchakirides Hartford, CT

Send those fees in if only to thank Bill for not naming his font Tchakirides' Dingbats! - JZ

Extra Reading Credit

I take strong exception to your review of the 11 best Mac books (December '89). Al-

though I own many of the books you list and use them semiregularly, you omitted the best technical reference to date: The Apple Macintosh Book by Cary Lu (now in its third edition).

Randy M. Zeitman Philadelphia, PA

Sorry, Randy (and Cary). For readers who want to make it an even dozen, The

 Now that Apple's Portable is a fait accompli, a low-priced Mac is next on a

lot of wish lists. The consensus from readers is that such a machine should cost about \$1,000 and come with one floppy-disk drive, a modest hard-disk drive, ADB, a built-in screen (but with an optional external monitor), and a 68000 processor. Of course, different people used different reasoning to reach this conclusion. Ann Greenberg of Brooklyn, New York, wants to see Apple "keep it real simple and sort of cheap. Build your consumer base at the bottom, reaching for the top, rather than just 'skimming the cream' of the wealthy corporations." A similar populist viewpoint comes from Judy Tuccinardi of Mt. Airy, Maryland, who appears to have an advanced case of Amigaenvy: "I see other computers with LARGE monitors and in COLOR for a lot less money than what a Macintosh with COLOR and a LARGE monitor would cost."

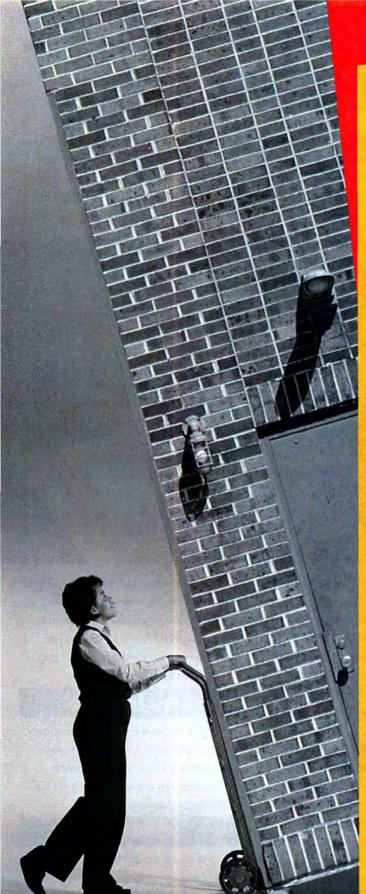
From the other end of the spectrum, an "MIS kinda guy" with his "hand on a pot of money," Sam Malenfant of Nepean, Ontario, Canada, writes: "Though a \$1,000 Ilci could be everyone's first choice, it is just plain not possible. Our use is foremost for a Macintosh. But it is also for a good 'dumb terminal' replacement."

Also piping up for the business user is Jason MacArthur of Marlboro, Vermont, who believes that "for this machine to succeed it would have to appeal to businesses and end users alike. If Apple did this, it would make the Mac an ideal business machine. The software is already there. The only thing missing is an entry-level data-entry machine."

CD-ROM isn't exactly new anymore, but neither has it taken the Macintosh community by storm. Despite Apple's apparent commitment to the medium, Apple's own player is more notable for technical glitches than runaway sales. If 1989 really was a make-or-break year for CD-ROM, then maybe it's time to start looking for the Next Big Thing.

What can Apple do to make you buy a CD-ROM drive

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Ric Honey, a project manager of new construction for Federal Express, knows a little about deadlines.

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"Managing 4 or 5 projects like that can mean a paper trail of over 600 forms at a time. All with pen and paper. I knew I had to do something."

So Ric looked into a database program for his Macintosh." "I chose Double Helix" because I didn't want to learn a programming language.

"I had a spreadsheet, and I knew it could do 'macros.' But I couldn't. If I could tell it in English what I wanted, fine. But I'm an awful typist. One finger. Try doing macros with that!

"When they told me about Double Helix, I said 'You mean I don't have to read anything? All I do is drag around icons, pictures? This is great!"



come up for my approval."

Now Ric and his team run the Double Helix multi-user application he created. He reports it's already cut 25% off his paperwork time.

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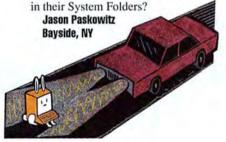


Apple Macintosh Book is available for \$21.95 from Microsoft Press, 16011 N.E. 36th, Box 97017, Redmond, WA 98073-9717; (800) 888-3303. — JB

Still Wacky After All These Years

Idisagree with John Dvorak's column "Abyss-ness Plan" (December '89). The "wacky enthusiasts" who made the Mac what it is today are not gone. Just read through

MacUser. Does Mr. Dvorak really believe that "lemminglike business geeks" are the people who buy some of the arcane stuff that appears in its pages? How many corporate executives need 500 different fonts or 20 different DAs

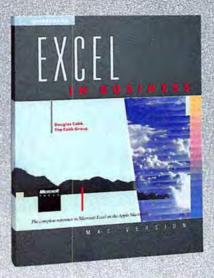


Slimmer but Slower

Michael Swaine's "Slimming the System" (December '89) contains good advice for users of dual-floppy Macs, but hard-disk users should be warned that taking files out of the System Folder could make their systems less efficient under certain conditions.

When compared to UNIX and MS-DOS, the Mac's operating system has a major disadvantage: The user cannot define a path through their folders that applications can follow in order to locate files that are needed during program execution. The only such path is a predefined one: The System automatically searches the System Folder when an application requires a configuration file, a program overlay, or other information stored in files. If applications are placed in the desktop-level directory (that is, not inside a folder) so that their icons are visible on the desktop, and if the files that these programs need are not in the System Folder, then the application cannot locate

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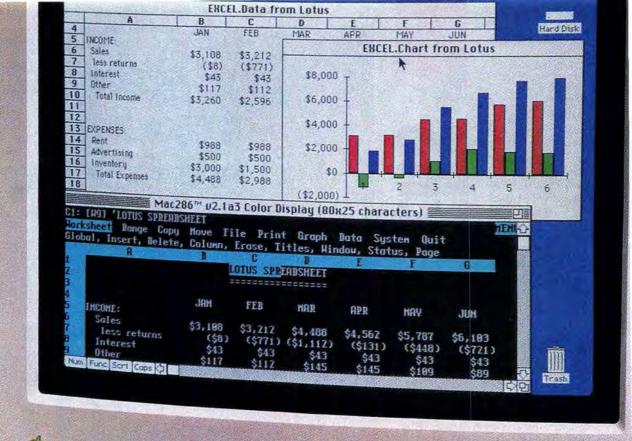
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mance is important.



these files. So the application displays an Open dialog box — and the tedium begins; the user must locate the file manually.

The hard-disk-drive user who follows Swaine's advice about moving configuration and other application files out of the System Folder may wind up spending a good deal of time manually performing tasks that ought to be automatic.

Bryan Pfaffenberger Pale Alto, CA

Hey I Can Write Letters!

In the dog-eat-dog world of software development, you take what you can get. Thank you for including Hey I Can Print! in StartUp (December '89). I realize our packaging and documentation are a little on the low-budget side, but users love our product. I can supply you with hundreds of testimonials. (So what if we write some of them; everyone else does it!) Really, we have numerous satisfied users.

You might be interested to know that the next version of Hey I Can Print! is on the way. It will be called Hey I Can Draw, Page Layout and Print! Hey I Can Print! 2.0 will feature real packaging and a new publisher.

Bruce Warila R&B Seftware Boston, MA

CLARIFICATIONS

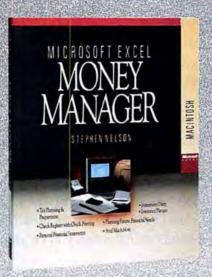
The Best . . .

The telephone number for Heizer Software was listed incorrectly in "The Best of Everything" (December '89). The correct number is (415) 943-7667. Also in that story, the price for CE Software's DiskTop was incorrectly listed as \$49.95, which is the upgrade price. The correct price is \$99.95.

. . . And the Quest

The Enchanted Forest, described in Flash Cards (December'88) is now called Quest for the Enchanted Word and is published by Nordic Software, 3939 N. 48th St. Lincoln, NE 68504; (402) 466-6502. It's available in a spelling version only for \$59.95.

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24-Bit Graphics Systems A Looks Are Impressive, B

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Our Spectrum/24 Series III 24-bit graphics card gives you the fastest QuickDraw acceleration on the planet—making painfully slow QuickDraw operations up to 25 times faster. In fact, some operations in 24-bit mode (like scrolling and screen-fills) are now faster than in 8-bit mode. Some are even as fast as in one-bit mode.

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And when it comes to looks, there's nothing more impressive than the super-sharp, flicker-free image of our new 19" Trinitron and other color displays. With their 75 Hz refresh rate and Apple-standard 72 dpi WYSIWYG screen-image, True Colors never looked better—all 16.7 million of them. We can even give you accelerated QuickDraw for your Apple 13" monitor with our new, low cost ColorCard/24.

All in all, it's just the kind of innovation you'd expect from the company that invented large screen color for the Macintosh.

So mosey on in to your local dealer and try your hand at accelerated QuickDraw. Ask for a showdown between our Spectrum/24 and any other 24-bit graphics system your dealer can round up.

And for those of you who don't need 16.7 million colors at once, we've also enhanced our Spectrum/8 family—rated "best in its class" by *InfoWorld* Labs—to give you the sharpest, clearest 8-bit color graphics you can buy.

Call us at **1-408-773-4498 ext. 300** for more information and the name of your nearest SuperMac dealer. Or FAX us at **1-408-735-7250 (dept. 300)** for a list of worldwide distributors.





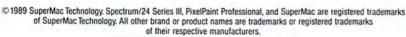








MacUser

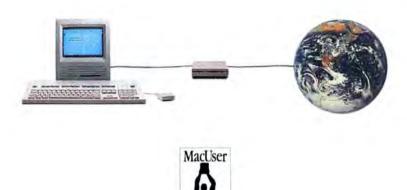


re A Lot Like Gunslingers. ut Speed Is Everything.



Images shown are actual screen-images photographed directly from a SuperMac 19" display. Original photography was scanned with a Barneyscan 24-bit scanner into PixelPaint Professional running on a Macintosh IIx equipped with a Spectrum/24 Series III graphics card.

Mac to any Fax



Now you can treat any Group III fax machine in the world as a remote printer for your Mac. With the Abaton InterFax, you can print letters, reports, and memos in Los Angeles, New York, London, and Tokyo, even if your office is in Peoria.

And all your documents will look as good off the fax as they would off an ImageWriter. No blotchy letters, streaky lines, or dirty smudges like normal faxes. With the Abaton InterFax, even your fine print is perfectly legible.

And the InterFax gets your fax out fast. *MacWEEK* rated it the fastest fax for the Mac. That's because the friendly InterFax software compresses your file first, then sends it out. So it takes less time to transmit.

You can also use the InterFax as a Hayes-compatible data modem to communicate with other asynchronous devices. Which makes it a great deal as well as a great tool. But that's not the only way it saves you money. With the InterFax, you can schedule when faxes are

sent—like right before a telephone conference, or after hours when the rates are lower. And because the InterFax receives as well as it sends, you can screen faxes before you commit them to paper.

Since the InterFax works in background — with or without Multifinder — you can continue working in PageMaker, Excel, Word, or most other Macintosh applications while you're sending or receiving faxes. Which makes you even more productive.

If you want to know why *The Macintosh Buyer's Guide* rated the InterFax 9.3 (out of a possible 10), call Abaton at 1-800-444-5321. We'll fax or mail you more facts about

the InterFax. Then you can start faxing (and printing) all over the world.



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n the past few months, we've seen an especially nasty virus out there. This virus won't corrupt your files or scramble your hard disk — it's a lot more insidious.

The virus is a venomous new round of Apple-bashing. While MacUser certainly roots for Apple to succeed, we're no apologists for the company. We take pride in remaining as objective as possible. If we see something we like, we say so. And if a product comes up short, we'll let you know.

Fortunately, Apple has made it easy for us to have good things to say by designing a series of sensational products in recent years. Of course, no record is perfect. For instance, as we noted, its terrific Portable boasts a long slate of winning features but could stand to shed a few pounds and inches. And while Apple has produced and midwived some wonderful CD-ROM software, its original player wasn't at the top of the heap.

Still, few companies can boast Apple's shining overall perfor-

tuous printers

have set new

the back of a truck and unload them at the swap meet before the rubes catch on.

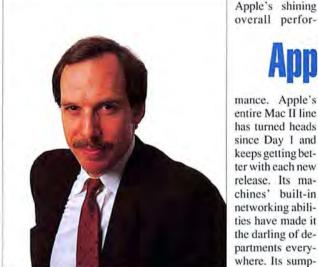
They mutter that Apple's market value took a billiondollar hit in just one week in

December. What they forget is that back in March of last year, the stock was in similar shape but rocketed skyward by the end of May. These entrails examiners attribute the current state of affairs to a pair of events:

PAUL

First, customers are passing over lower-performance Apple systems such as ancient Apple IIs and Mac SEs in favor of higher-powered ones. Such buyer sophistication is somehow suspect. The naysayers fail to mention that the Mac market is shifting from bargain-minded individuals to serious business users with bigger needs and deeper pockets. Which has been Apple's strategy all along.

Second, the Portable's high-tech active-matrix screen has been in short supply.



BY PAUL SOMERSON

Apple-Basher Bashing

mance. Apple's entire Mac II line has turned heads since Day 1 and keeps getting better with each new release. Its machines' built-in networking abilities have made it the darling of departments every—

So, because short this country, this part and-doom prophets Which is crazy, so that Apple has purpopular, upscale sy which companies in quarter, they're any logical or marketing 2. The column ware vendors are

quality standards.

And its trademark intuitive user interface has not only withstood the test of time but has also spawned a litter of copycat
desktops, most of which are runty, wheezy, and slow.

Businesses have figured this out. At least the smarter ones have, the firms that truly care about productivity and employee satisfaction. Macs have become a significant force in companies of all sizes, despite K mart-style pricing of IBM clones, the entrenched smugness of the DOS high-priest MIS class, and the endless promises that the very next generation of every Intelbased system was finally going to be standard and easy.

If this sounds to you like knee-jerk DOS bashing, it's not. It's just another way of repeating the message Apple has used successfully in its ads: Stick a user in front of a Mac and a similarly configured PC and see which one actually gets used.

But there's trouble in paradise. Page through the opinion columns of just about any non-Mac publication these days, and you're likely to see some misguided pundit predicting the demise of Apple. Why is this happening?

1. The Wall Street voodoo shamans are sniveling that Apple's stock price is down. To them this means the jig is up and that any sane person should throw all his Macs in

So, because short-term earnings seem to mean everything in this country, this pair of temporary conditions has the gloomand-doom prophets unloading Apple shares for chump change.

Which is crazy, since what both these events *really* mean is that Apple has put together a slew of extremely capable, popular, upscale systems that business buyers are craving.

Besides, while stock prices may tell pension-fund managers which companies may be buying chips most shrewdly this quarter, they're anything but foolproof indicators of technological or marketing prowess.

2. The columnists are twittering that DOS-hardware vendors are slashing prices so ferociously that Apple can't compete without losing the farm. The Wall Street Journal recoiled in horror recently at the fact that the Mac Plus was actually selling for a street price of less than \$1,000. And worse, that manufacturers were so driven to desperate acts that they were forced to give away software!

This recalls the old joke where the jeweler's assistant misreads a price tag and sells a \$995.00 item for \$9.95. When the jeweler learns of the sale, he's initially furious but later admits, "Well, it's OK, we still made five bucks on it."

Apple doesn't lose money on a thousand-dollar Mac or mind tossing in ten bucks' worth of disks and manuals either.

No matter what, some businesses are going to be seduced by the seeming savings in buying \$500 no-name DOS clones. Some people bought Yugos too. In the long run, both are busts.

3. In this news-crazed what-have-you-done-for-me-lately world, several wags are grumbling that Apple hasn't churned out anything dazzling for a while. The company that revolutionized the computer indus-

he Wall Street voodoo shamans are sniveling again — but their reasoning is suspect. try and turned the words productivity and interface into something more than just ad agency hype is now expected to produce machines that can levitate off the desk and transmute base metals into gold.

Ignoring for the moment that Apple's

SkunkWorks is, by all accounts, working on some pretty breathtaking stuff with color, video, sound, alternative input, dazzling output, and even sexier interfaces, what are these Apple bashers using as a yardstick? These days top-of-theline DOS systems are remarkable for three reasons: First, in many ways they're essentially just very, very, very fast replicas of dated IBM PC XT technology; second, the standards wars on the IBM side are starting to get so catty and dirty that they should bring in Hulk Hogan and put the battles on UHF; and third, prices of the

hottest DOS hardware are beginning to claw into minicomputer territory.

Apple isn't perfect either; it still doesn't support true, preemptive, protected-mode multitasking, and its sizzling System 8 interface is not exactly on its way through the shrink-wrap machine. But its hardware certainly doesn't take a back seat to anyone else's, and its user interface can still do laps around the competition. Macs are still clearly superior systems. Period.

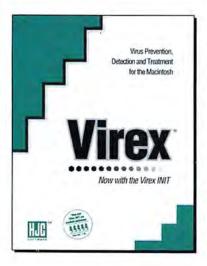
4. Finally, they're all arguing that OS/2 and Presentation Manager are beginning to deal the coup de grace to Apple. Are they serious? Have these guvs ever actually used a Mac side by side with a typical IBM clone running OS/2 and PM? The Mac interface is seamless and silky. OS/2 is clanky and quirky. The Mac interface was designed into the system and the system was built as a graphics machine from the beginning. OS/2 feels like something slapped on that degrades performance, like a catalytic converter, and the tepid PM graphical abilities seem like a kludged-up afterthought. On a typical IBM clone, all they really do is slow everything w-a-y d-o-w-n

Besides, the Mac user interface runs decently on even a lowly Plus and works consistently on every Mac model. OS/2 and PM won't work on any of the millions of 8088-based machines and won't budge on newer systems without 3 megs of RAM plus pricey video and storage hardware. And while there's precious little application software out there for OS/2, there is plenty of system competition for it from Windows, old DOS diehards, and third-party multitaskers.

Years from now, when the annoying corners are smoothed off OS/3 and commodity supercharged IBM clones are sufficiently plentiful and apps are written to make OS/3 shine, business may actually use it. But by then, all hardware platforms will be interconnected, and Apple will have widened its interface and technology leads. You can bank on it.

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O.K. so it won't do all of the above, but it is new and improved, and it will let you use the printer you want with your Macintosh™. Announcing the Grappler LX, the latest advance in Macintosh printer interfacing! Over the past 9 years, the Grappler name has been synonymous with innovation and excellence. This tradition has now created the pinnacle of Macintosh printer compatibility and performance.

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Apple can't touch this.



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"Clearly in a class by itself."

That's how *MACazine* judged the MAC-101, our advanced keyboard for the Macintosh."

It's not hard to see why.

With the MAC-101, you can work the same fast, simple way

But MAC-101 can find them a real job. By using our *MasterStrokes* enhancement software to assign them dozens of mouse or keyboard commands.

Even functions that would otherwise need numerous keystrokes—

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The MAC-101 lets you execute program commands with a keystroke-without having to reach for the mouse.

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It's the only keyboard that works with every model Macintosh.

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Function is as function does.

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or mousestrokes—can now be assigned to just one key.

Feeling is believing.

Obviously the MAC-101 is great news for every Mac user. But for IBM° types who are feeling

But for IBM types who are feeling their way around on the Mac, the news is even greater.

Because our keyboard is laid out in a standard configuration that's identical to the IBM PC.

Which means that anyone who's used to an AT or PS/2—or a Selectric, for that matter—will instantly know the MAC-101 like the back of their hand.

And type on it accurately, with the confident touch that comes only from tactile, positive-response keys.

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That's how *PC Magazine* sizes up the MAC-101. While *MacWEEK* calls it "the most important accelerator you can buy for a Macintosh."

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software included. And since it carries a two-year warranty, you'll be enhancing your piece of mind right along with your Mac.



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Once you do, you won't let go.



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ROBERT R. WIGGINS

ne of the questions most frequently asked by Macintosh users, especially those who've just had a Mac land on their desks out of the blue, is: "Where do I go to learn all the little tricks of the trade? In other words, how do I become a power user?"

In the MS-DOS world of the IBM PC, it's easy to progress from novice to expert; all

you have to do is learn some arcane commands and you're a pro. Becoming a Macintosh power user is more problematic. Mac programs make life so simple while hiding their complexity so well, that it's hard to dig beneath the surface ease of use to find support have high-level executives fielding questions about policies and future company direction, as well as programmers answering the really tough technical questions that no one else understands.

All you need to get on-line is a modem and some software. Before you buy a modem, though, check to see if your company has special purchasing agreements with companies selling modems; you might

save a few dollars. Also, make sure you even need a modem: You may have access to a modem server over AppleTalk in your office; why buy if you don't have to?

When shopping for a modem, concentrate on the 2,400-bps

Network Networking

out what's going on. You can buy books, but most Macintosh books seem to aim either for the pure novice or zip straight over your head into the complex realm of the programmer. So what's a poor Mac user to do?

At the same time, one of the questions most frequently asked by Mac hardware and software companies is: "How do we best differentiate our offering from the competition's?" After features and pricing, the answer usually comes down to support, and the question becomes: "How do we give the best possible support without going bankrupt?"

It turns out that these two seemingly unrelated questions have a common answer: Go on-line. For some reason that no one has ever adequately explained, most Macs in the early days were sold with modems. Even today, compared with other kinds of computers, a higher percentage of Macs have modems attached to them. People with modems like to use Macs, so if you go on-line on one of the hundreds of local Macintosh BBSs (bulletin-board systems) or to one of the national information services such as CompuServe, GEnie, Prodigy, America Online, MacNet, Delphi, or NWI, you will find hundreds, even thousands, of other Mac users. They'll be sharing information and even some nifty software (such as some of the shareware and free-ware products you read about each month in "Bobker's Dozen").

Many of the people you'll meet on-line are power users themselves, and most of them will be happy to answer questions and explain things to a newcomer. You can even learn just by observing as users help each other, but your best bet is to charge right in and ask your own questions. (And remember, the only really dumb question is the one you don't ask.)

For vendors, on-line is a wonderful place to support products. The people who frequent on-line services are often opinion leaders (including some of the computer press); maintaining an on-line presence lets these people know you care about your product and gives them a place to get product-support questions answered without the busy signals and missed callbacks of a telephone support system. Many companies providing on-line

models. Most commercial services, and even many local BBSs, support 2,400 bps, and faster is better (and cheaper) for going on-line. You'll also see some 9,600-bps modems, but most commercial services do not offer 9,600-bps service yet, and

there are conflicting types of 9,600-baud modems — so for now, stick to 2,400.

Your software choices aren't quite as wide as the selection of modems, but a good many options are available. The three most popular general-purpose terminal programs are MicroPhone II, Smartcom II, and White Knight (formerly Red Ryder). Any of these will get you on-line with most major services and local BBSs. CompuServe offers special software, the CompuServe Navigator, that makes using its service easier, Prodigy, America Online, and MacNet all require the use of their own special software, which you get when you buy their startup kits.

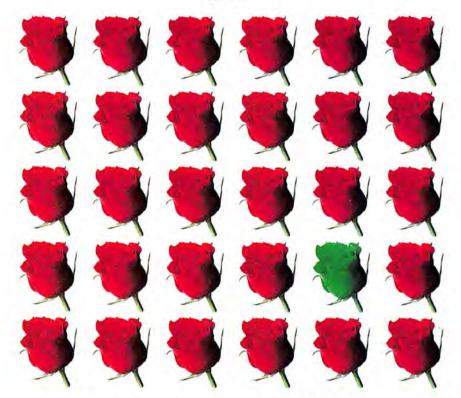
Once you have your modem and some software, you're ready to go on-line. So where should you go? The least expensive option is to try local BBSs. You can find out about them by word of mouth or from your local user group. When you log on to a local BBS, you'll be interacting primarily with other local users, so you can think of it as an extension

hether you're
a user wanting to
learn more about
the Mac or a
vendor trying to
support your
customers, on-line
is the place to be.



BY ROBERT R. WIGGINS

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most BBSs, you can post messages, send and receive private mail, and upload and download software. If you're going to get software this way, be sure to practice safe computing by using an antivirus program.

of your local user group. On

The real action, though, is at the national level. Commercial information services are like giant BBSs, with thousands of users calling in from all over the U.S. and, on services such as Compu-Serve, from all over the world. Whether you're looking for advice or software to download, the biggest services are probably the best place to start, so look into CompuServe and GEnie.

If you're a vendor looking to offer online support, these are also the two main services for you to consider, because they reach the largest audience. Although using the smaller services is fine, you should maintain a presence on the large ones as well. CompuServe's strengths are its large user base, its own data network, and its special forum software that allows "threads" of messages so you can easily follow (and backtrack through) conversations. GEnie's strengths are its rate structure, its own data network, and its good downloading performance. Compu-Serve and GEnie have two very different looks and feels, so try both.

The latest trend is networks with special Macintosh front ends. MacNet, Prodigy, and America Online require special software for access. The software makes using these services more Mac-like, but it also introduces additional overhead that sometimes makes them slower than the text-based services (varying from slightly slower to much slower, depending on the service, the time of day, and what you're doing on the system). These services are definitely worth a look, and they'll become more attractive as they acquire more users and work out the kinks. (See the review of America Online and Prodigy in this month's StartUp section.)

It will take a while to get the knack of using your modem, software, and services — there's a lot to learn — but you should soon get to the point where you can access the expert help available online. Whether you're a user wanting to learn more about the Mac and gain valuable insights, or a vendor trying to support your customers, on-line is the place to be.



You Have Better Things To Do Than Back Up

If you can think of better ways to spend your time than backing up your hard disk, you need Fastback II. It's the world's fastest and most reliable backup software for the Macintosh. It's also the easiest to use, with simplified file selection, adaptable FASTBACK || data compression, advanced error correction and other features to make your backups fast and foolproof.

MacUser

You can even schedule automated backups to take place at any chosen time. Even when you're otherwise occupied.

After all, you have better things to do.

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INTRODUCING NEW DISKLOCK

Unbreakable password protection for the Macintosh

It's sad but true. All it takes is a few minutes with your back turned, and an intruder could walk away with your most confidential data. And vou'd never even know it!

Unsurpassed Password Protection

Now the leader in hard disk security announces the ultimate data protection system for your Macintosh. DiskLock works with any SCSI hard disk to provide foolproof password protection for individual files, folders, or your entire hard disk. You can even protect all three levels with different passwords for absolute maximum security. DiskLock automatically locks your files when you shut down or leave your Mac unattended, and alerts you to any unauthorized access attempts.

Sophisticated Data Encryption State-of-the-art data encryption adds yet another layer of security. Without the proper password, your confidential files appear to contain nothing but gobbledygook!

Multiple Security Levels. DiskLock lets you give each user password access to just the files you choose (word processing files for your secretary, accounting files for your bookkeeper, etc.). The master password gives you access to all files and folders.

Virus Protection, too! If DiskLock's automatic virus checker detects an infection when you log in to a file, it notifies you and stops running

immediately.

FIFTH GENERATION SYSTEMS... FIFTH GENERATION SYSTEMS For a complete list of features and

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specifications, or the name of your nearest dealer, call 1-800-873-4384.



had been drinking Kool-Aid. Extravagant perks don't usually cause people to create a great product. Otherwise, oranges would be an endangered species in Silicon Valley.

GUY

Exercise: It may be said of men in general that they are ungrateful and fickle, dissemblers, avoiders of danger, and greedy of gain. So long as you shower benefits upon them, they are all yours; they offer you their blood, their substance, their lives and their children, provided the necessity for it is far off; but when near at hand, they revolt. - The Prince, Machiavelli

Why was Machiavelli wrong?

- a. He didn't give stock options to his employees.
- b. The market for IPOs was poor at the time.
- c. The capital gains tax in Italy was too high.
- d. He never met Steve Jobs.

This is an old quote - predating even Xerox PARC. Unfortunately, many companies treat their employees this way today. Or companies think that the promise of quick riches from options, IPOs, and capital gains are the key to finding and keeping great employees. According to the Macintosh Way,

Macintosh Business Administration

worked very hard to get this space as a columnist in MacUser (I even had to write a book as a screen test), so I'm not going to disappoint you. In one short sentence, the purpose of this column is to celebrate owning a Macintosh; the Mac — along with the magazines SPY, Car and Driver, and Esquire - is my inspiration.

This first column is dedicated to Mac users who just don't get the "Macintosh Way." (There are a lot of them now, because IBM PC owners have started buying Macs, and Macintosh is making it in business.) The Macintosh Way is an idealistic approach to doing business. It means doing the right things and doing things right. It is absolutely antagonistic to the Status Quo and Mediocrity.

Those of you who practice the Macintosh Way need read no further. Those of you who don't probably should. Here are the most important exercises presented in my book The Macintosh Way, with their answers; they cover the history of Macintosh, the work environment, support, and marketing. Reading these exercises is a quick way to get an MBA - a Macintosh Business Administration degree.

THE HISTORY OF THE MACINTOSH

Exercise: Give the employees of your company fresh orange juice. Buy a grand piano for your foyer. Let them fly first class. Give them massages every Friday afternoon. Did they create a Macintosh?

The Macintosh Division at Apple had special perks such as fresh orange juice, a Bösendorfer grand piano, flying first class, and company-paid massages on Thursdays and Fridays. Some people think that these perks motivated us to create Macintosh. Nothing could be further from the truth.

An idealistic dream to enhance the productivity and creativity of people and to change personal computing caused Macintosh. We probably would have created Macintosh even if we

people achieve extraordinary results when they share a dream and are lead by a charismatic high priest like Steve Jobs. Machiavelli's kind of thinking most properly belongs in the anals of history.

THE WORK ENVIRONMENT

Exercise: If one programmer can finish a product in one year, then a six-programmer team can finish the product in:

- a. two months.
- b. Never
- c. one year.
- d. two years.
- e. time for the board of directors meeting.

Great products are intellectual and artistic works. Often companies consider product development an assembly-line process. Nothing could be further from the truth. Throwing more programmers or artists at a project doesn't mean it will finish faster. Or be better.

Therefore, the answer can't be two months. It could easily be never. One year is being optimistic. Two years is most likely. In time for the board meeting is the answer for the management team that leaves "to pursue other interests." The best way to find out BY GUY KAWASAKI how long programmers will take

f you were stumped by the exercises in my book The Macintosh Way, here's a handy crib sheet.



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KeyPlan

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 Only KeyPlan allows you to outline what needs to be done and quickly turn it into a full-blown plan.
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Symmetry



to finish is to ask them and multiply the answer by 2.

SUPPORT

Exercise: Call the downtown Seattle Nordstrom store and ask to speak to Bruce, Jim, or John Nordstrom, or John McMillan.

Exercise: Call Apple at (408) 996-1010 and ask for technical support.

If you call both Nordstrom and Apple, you'll find that it is easier to talk to the founders and president of Nordstrom than to technical support at Apple. Nordstrom is a \$2-billion chain of department stores based in Seattle that is spreading across the nation. It has incredible customer service.

A Nordstrom store forces improvements in customer service for all of the stores around it. Great support means putting the customer in control, taking responsibility for your shortcomings, not pointing the finger, underpromising, and overdelivering. To be honest, it's also much easier to write about great support than to achieve it.

MARKETING

Exercise: Send a Stufflt document to anyone in the Macintosh community. The people who can read it are in The Cult. The people who can't are not.

In most markets, there is a "head" that contains power users; aficionados; and a small percentage of luminaries, analysts, press, and dealers. It's easy to find people who are in The Macintosh Cult because they use cool utilities such as StuffIt. (StuffIt is a shareware utility by Raymond Lau that compresses files to save disk space and reduce E-mail transmission time.)

A Cult is intrinsically elite, more discerning, less tolerant of mediocrity, and more willing to accept new ideas. It's a good place to start your marketing because those within it are the people whom everyone else asks, "What do you use?" "What do you recommend?"

Conclusion

Don't ever let anyone tell you differently: There is a better way. The Macintosh Way. It means a great environment, a great product, great support, and great marketing. But you already knew that, so put down this magazine and go spread the word.

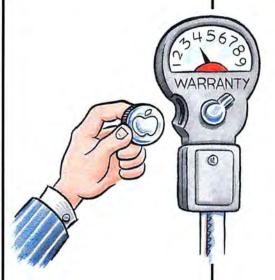


The Macintosh Curmudgeon: Jaundiced Jargon

If you think the technical mumbo jumbo of videotape, RAM, and ROM is confusing, consider the business side of the Apple/ Macintosh vocabulary. Here's some help with a few words for the would-be wise:



Apple Marketing: The largest group of migrant workers in California.





Microsoft

Software that generates psychological profiles of people who form strategic alliances with those they fear against those they hate.

12-month warranty:

Nine months of free AppleCare.



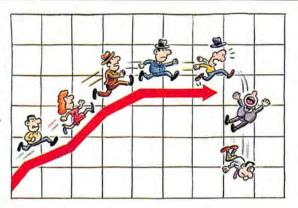
A mathematical formula to increase the sales/employee ratio while deteriorating the bottom line.



By Guy Kawasaki

Redeployment:

A layoff that does not affect the stock price.



Streetings From CODE COLUMN STREETINGS From ST

Sabbatical: An extended vacation to prepare for being redeployed.

Offsite:

The gathering of upper management at exotic places to discuss how to save money by redeploying people.



Seniority:

The experience of surviving two reorganizations.



The Macintosh Weigh:

The total poundage lost by Louise Kohl, Robert Wiggins, Mike Boich, and Tom Rielly. Currently equal to about 50 cans of Crisco.

NewsLine

Reports and Analysis

XEROX SUES APPLE

SAN FRANCISCO, CA - In a move that many observers have expected for years. Xerox has filed a \$150 million copyright infringement suit against Apple Computer, claiming that Apple derived the Macintosh (and earlier Lisa) computers from programs that Xerox developed at its Palo Alto Research Center (PARC) in the early '70s. The suit seeks to have Xerox declared the sole owner of key elements of the graphical user interface, including the Finder. Xerox's suit states that Steve Jobs saw a demonstration of Smalltalk at Xerox PARC in 1979 and that other Apple employees saw a demonstration of Xerox's Star program in Houston in 1981. Xerox alleges that Apple's design and the appearance of the Lisa and Mac system copied substantial portions of the Xerox code seen at those sessions. In response to the suit, Apple's Carleen LeVasseur said that although Apple acknowledges Xerox's role in originally developing many of the ideas subsequently implemented in Apple products, ideas can not be copyrighted. Xerox spokesman Thomas C. Abbott said that the suit was filed after the companies failed to reach an out-ofcourt settlement in early December.

PROMETHEUS SUSPECT SUBPOENAED

NEW YORK, NY — A former Apple Computer engineer, Grady Ward, has been served with a grand-jury subpoena in connection with the nuPrometheus League's distribution of material purported to be proprietary Apple system code last June. Ward has denied any involvement in the incident but has agreed to cooperate with the FBI, which is investigating the case. Ward reports being told he is one of five suspects with access to the code who the FBI believe are most likely to have disseminated the software.

SUN SETS ON US MEMORIES

MOUNTAIN VIEW, CA — In another big blow to US Memories, the nascent U.S. DRAM consortium, Sun Microsystems has decided not to invest in the venture. Sun's decision was based on the company's recent signing of agreements assuring it a plentiful supply of DRAM chips from various suppliers. Sun's decision came close on the heels of Apple's rejection of US Memories for similar reasons.

Bobker's Dozen

Good Things and Small Packages

BY STEVEN BOBKER

Bobker's Dozen, c/o *MacUser* 950 Tower Lane 18th Floor Foster City, CA 94404

Your suggestions, comments, and products for consideration are welcome.

OPhone Line Manager 103

It's not enough anymore to have separate phone lines for voice and data communications. Now that the fax is becoming an essential part of the office, La Cie's handy Phone Line Manager 103 is a superb way of avoiding the expense of additional phone lines.

Connect a phone line to the

Phone Line Manager, and then connect your fax, modem, and phone to it. The calls for the fax are usually given priority so it can receive incoming faxes, unattended. Simple commands that you program when you connect the phone line allow people calling in to reach your modem. If special signal tones aren't generated,

your phone rings.

Setup is easy as pie, and the program does exactly what it promises to do. There's a

slight degradation in voicecommunications quality and, I'd imagine, of modem-connection quality, but I never had any difficulties that could be even remotely blamed on



the Phone Line Manager. It's an excellent value and worth a place in every modern office.

\$199.95. La Cie, 16285 S.W. 85th, Suite 306, Tigard, 0R 97224; (800) 999-0143 or (503) 684-0143.

Macintosh Portable.....**



The Mac Portable needs a lot more work before it can be called perfect. It's heavy (about 16 pounds in the case) and far too pricey (\$7,597 with hard disk, extra megabyte of memory, and modem — the extras shouldn't be considered options). However, it is also the best

portable/laptop ever made.

The up-to-12-hour battery life is excellent. The screen is a star—readable from a wide range of angles and under a variety of lighting conditions (the notable exception being low-light situations). Its speed is roughly twice that of an SE and quite adequate. The special software is virtually perfect.

Aside from reducing weight and price, Apple needs to make

a few other changes. The keyboard should be extended with function keys. The screen should have a backlighting option, since it's nearly unreadable in dim light. Even 2 megabytes isn't enough to run HyperCard under MultiFinder, and so far, static-RAM SIMMs larger than 1 megabyte are nonexistent. Still, the Macintosh Portable is the best CPU of its type — ever.

\$7,597 (including hard-disk drive, extra megabyte of RAM, and modem card). Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; (408) 996-1010.

3 Baker's Dozen ♣★★1/2

How could I not like a game solitaire game

with a name like Baker's Dozen?
It's a solitaire variant I haven't seen before that is just what a good solitaire game should be: mindless, moderately easy to win

if you try, and addictive. The display is cramped, and the artwork on the cards, while nice, is not up to the standards of Mike Casteel's shareware solitaire games (Klondike, Canfield, and Golf). The score and statistics are displayed in a font that's too small for my aging eyes, and there's no support for color in this version. Still, it's playable and a lot of fun. Version 1.0. Shareware; \$10 with

Version 1.0. Shareware; \$10 with Montana 2.0 (another solitaire game). Eric Snider, 4941 Woodcliff Hill Road, West Bloomfield, MI 48033; (313) 883-2918.

Moriarty's Revenge

Tracking bad guys around the globe is game-playing aids (note forms and the like), and the Rand McNally Pocket Atlas that urse of your pursuit, you learn comes in the package.

the aim of this pleasant game. In the course of your pursuit, you learn some geography and sharpen your reasoning powers. In each of the many scattered locations, you get a choice of various places to "investigate." By going to the correct places, asking the right questions (from the choices displayed), making the correct deductions, and hurrying on to the next place on the globe, you catch the villains. You need to make use of the built-in

The simplest level is fairly easy, and the ultimate level is very difficult. The graphics are nothing special — and not in color. The game is copy-protected, and Multi-

Finder incompatibility is a serious annoyance. This isn't the ultimate Mac game, but it is a pleasant way to pass time.

Version 1.01. \$59.95. Bull City Software, P.O. Box 51816, Durham, NC 27717; (919) 490-1277.

INIThound

This is strictly pro gear. A nonprogrammer might find most of the INIThound output interesting, but there's not much more that anyone but a programmer, network administrator, or system administrator can do with it but stand back and marvel.

INIThound is an INIT that loads itself first at the beginning of the INIT loading process and then has the ability to examine in minute detail what every other INIT does as it loads. Among the things it tracks are all memory changes and allocations, and all trap patches. You not only see what was done but also the order in which the changes occurred.

*

This kind of information is vital in tracking and eliminating INIT conflicts.

Reports are ordered up from a cdev or Control Panel interface. The reports are well designed and are available at several levels of detail, from simple one-page listings to full-detail reports (the full-detail report for my Mac ran 36 pages). Users can also use this cdev to enable and disable INITs during startup. Sets of INITs can be saved and enabled or disabled as a group, simplifying debugging.

Version 1.0. \$129. Cambridge Information Ware, P.O. Box 1296, Cambridge, MA02238-1296; (617) 484-8364.

SuperANOVA

any of the basics.

If you create mathematical or statistical models, check out SuperANOVA.

It's a slick generallinear-modeling program. The interface is as elegant and intuitive as I have ever seen in a

program of this complexity. And it has a huge range of features — all readily accessible.

A word of warning is in order, however. This is not a general statistics package — you need some knowledge about general-linear-modeling before you start. The manual is wonderful and very detailed, but it doesn't waste any time on

any of the basics.

Data entry is easy, and data can be imported from

virtually any source. The number crunching is quick and smooth. A good selection of "canned" mod-

els is included, and your own work can be saved as Do-It documents so that you can quickly use it again for similar jobs.

Version 1.0. Two versions available — one for the Plus, Portable, and SE; the other for the Mac II and SE/30 (reviewed). \$495. Abacus Concepts, 1984 Bonita Ave., Berkeley, CA 94704; (415) 540-1949.

🕜 Letterforms & Illusion



Letterforms & Illusion is a barrel of fun. It was coauthored by Scott Kim, the graphic artist best known for *Inversions*, a collection of typographic designs that can be viewed from a variety of angles and still make sense. Letterforms & Illusion lets you

create your own inversions, but there's more to it than that. It's a set of visual puzzles, images, and games that are fun to fool around with and that help you learn about words and type.

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All the special fonts necessary are included. These fonts can also be used in your own graphic creations. A specially modified version of MacPaint is also included, as most of what you'll be creating is elaborate bit-mapped graphics.

Letterforms & Illusion teaches you a lot about type and should make you more aware of what good — and bad — design is. It makes an education in graphic design a pleasure.

\$39.95. W.H. Freeman and Co., 41 Madison Ave., New York, NY 10010; (212) 576-9400.

Preditor ***

Programmers create their code in specialized programs

called editors that generally include advanced search features and automatic checks of various delimiters.

Preditor is the newest of these edi-

tors. It's a good one, with rectangular-editing ability (you can select a column of material to work on).

Preditor's searching abilities, which are somewhat difficult to access, need to be better documented. Experienced programmers shouldn't have too much difficulty with Preditor's version of GREP,

but newcomers won't be able to take advantage of its full power. The interface has its strong points, and once it is thoroughly learned, it's OK. But there are

too many buttons and boxes that either don't do anything except provide data, or don't do what you expect. Plan to spend some time coming to grips with this interface.

Version 1.0.1. \$90. Evatec, P.O. Box 219093, Portland, OR 97225; (503) 297-6175.

The FileMaker Report

The best FileMaker power tool arrives every four to seven weeks in an envelope. It's called the FileMaker Report, and it's a newsletter overflowing with tips, articles, fixes, and other useful information for users of all versions of FileMaker. FileMaker Report has been produced by FileMaker experts since the earliest versions of the program and owes no allegiance to any of the program's publishers, including the current publisher, Claris. That lets the newsletter's producers call the shots as they see them.

The overall quality is excellent. If you're using File-Maker and not getting the *FileMaker Report*, you're not getting as much as you can out of your software.

Five Issues/\$27. Elk Horn Publishing, P.O. Box 126, Aromas, CA 95004: (408) 726-3148.

Perceive

Perceive is a music-education program aimed at the school environment. Although its segmentation and structure

make it excellent in that setting, it's also useful for individuals wishing to study on their own.

The package consists of six

modules of varying quality. The first module, called Tutor, is for ear training in major scales, all three forms of minor scales, the pentatonic scale, and much more. Drills is exactly that: It works on scales, intervals, triads, and seventh chords. It's impressive. MiniDesignWave takes user-entered numeric descriptions of sounds, draws the

corresponding waveform, and then plays the sound. MiniWaveDrawdoes the same thing, only in reverse. You

> draw the wave, and the program plays the sound and provides a numeric array that describes it. The Sound Machine lets you combine

a variety of sounds and hear the output. Tunings lets you hear and experiment with historical systems of tuning.

I got the most from Tutor, Drill, and Tunings; more-advanced students would find the rest of the package more useful.

\$99. Coda Music Software, 1401 E. 79th St., Minneapolis, MN55425; (612) 854-1288.

1 Paradigm

ttt1/2

Does the world need yet another object-oriented drawing program? If the program does something special, the answer is yes. Paradigm is such a program. It adds relational drawing abilities to the basic drawing package. In an ordinary drawing program, moving a selected point causes all the other points to move with it in a one-to-one relationship. In Paradigm, all points that connect to, or depend on, the selected point have their positions recalculated according to user-specified equations. It's quite simple to create drawings that appear to rotate in three dimensions as a single point is moved about on the plane by setting an amount of proportional movement.

Paradigm rated strictly as a drawing program wouldn't rate well. The controls are more difficult to figure out than they need to be, and the range of features, other than relational drawing, is ho-hum. The relational-drawing abilities are valuable, however. On a Mac IIcx, performance is quite acceptable, although it might be slow on other machines. If your work involves drawings that must be frequently updated or that have objects whose position or size is time-dependent or relates nonlinearly to other objects, Paradigm will be a real time- and effortsaver and is worth investigating.

Version 1.0. \$120. Aculty, 2340-B Grant St., Berkeley, CA 94703; (415) 841-9533.

1 Thunder Scan

ThunderScan has been around for a long time. It was the first scanner for the Mac, and comparatively speaking, it still does an acceptable job, albeit very slowly. It also provides a use for that old ImageWriter you've had laying around since you switched to laser printing. An ImageWriter carries and moves the scanning mechanism — it replaces the ribbon cartridge — and also moves the image past the scanner head. That means the image to be scanned must be on a single, loose sheet of paper. That detail might prove to be a significant drawback. Overall, though, the mechanical design is ingenious. A standard power acces-

sory for Macintosh II is required for Macintosh II-series machines.

ThunderScan can scan up to 32 levels of gray, but because of monitor limitations, you can only see 16 gray-scale levels on gray-scale monitors. The scanned images are bit maps but can be saved as PostScript files as well. There's a more than adequate range of contrast, brightness, and size controls. The only drawback is speed. It can take 15 minutes, give or take a few, to scan a busy full-page graphic. If you have the

Writer and the

ImageWriter and the time, however, you can duplicate or surpass the results of setups that are far more costly. For input on a budget, ThunderScan is still a viable answer.



Version 5.1. \$249. ThunderWare, 21 Orinda Way, Orinda, CA 94563; (415) 254-6581.

Synchronicity

When you talk about odd software, don't ever leave Synchronicity off the list. From one viewpoint, it's only an elaborate version of the *Book of Changes* or *I Ching*. From another viewpoint, it's an elaborate stress-reduction and decision-enhancing tool. If you really want to, you can even see it as a game. I'm usually skeptical of software like this, and I didn't expect much from it. I was pleasantly surprised, however.

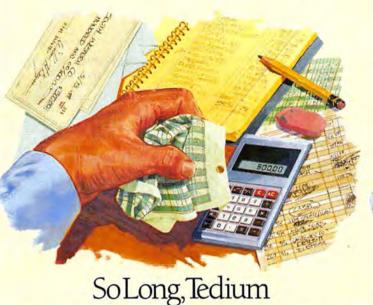
Synchronicity's graphics are excellent,

the sound's good, and the overall program provides an excellent way — for me, at least — to relax and reduce stress. Taking breaks can increase your productivity, and Synchronicity is a good diversion.

A shareware version is available, but it lacks many of the full version's features and disables itself after a certain number of uses. Get the full version; it's much better.

Version 2.0. \$49.95. Visionary Software, P.O. Box 69191, Portland, OR 97201; (503) 246-6200. Say Goodbye to Financial Hassle!







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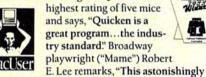
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SPECIFICATIONS
Software Compatibility: Exports to SYLK, Text, Excell
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Hardware Compatibility: All Macintoshes with at least 512K RAM. Works with your printer and monitor, we guarantee it. Capacity: Unlimited number of bank accounts and transactions (subject to available disk space). Maximum

transactions (subject to available dask space), maximum amounts to \$9,999,999,99.

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Quicken is available at most computer and software stores.

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G-MU03

Do you need

Can't sleep? Tired of late night TV? Cheer up, Bunky! There's nothing more entertaining than placing an order for Mac peripherals or software from MacConnection—and our order line is now open 'til 1 AM! By the way, our tech specialists are still at your beck and call (but particularly your call) only between the daylight hours of 9 AM and 5:30 PM. But we're ready to take orders anytime from 9 AM 'til 1 AM EST.

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MacConnection

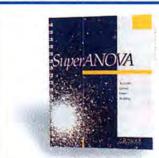
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	A Lasting Impression
5465	ResumExpert
5749	Cover Letters
5853	Sales & Marketing
6363	Computer Science & Engineering 39.
6374	
6364	Students
5852	Management Edition 39
	Ashton-Tate
1324	FullWrite 1.1
	Blyth Software
	Omnis 5
5855	Omnis 5 (Additional 1 user) 75
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1532	DataScan 1.03 109
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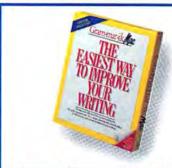
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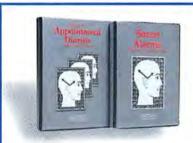


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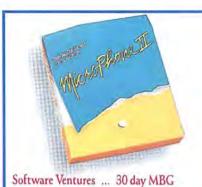
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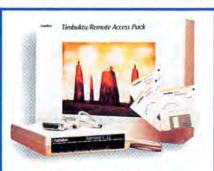
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Forecasted Estimate at Completion

The CSW (Cost/Schedule Workshop) is a collection of interrelated project-management tools for handling large, sophisticated projects. It's primarily intended for use with government contracts. Each program in the CSW is a stand-alone application, but the tools can also share information by copying and pasting. A forthcoming free upgrade to Data Manager software will allow ASCII import and export with code translations and currency conversions (handy for multinational projects). CSW is also being

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marketed with MicroPlanner Plus and Micro-Planner Xpert, more-generalized project-management systems, and the future version of Data Manager will allow direct import and export between CSW and MicroPlanner.

FEAC (Forecasted Estimate at Completion) is the part of CSW that you can use to develop an EAC (Estimate at Completion) or to test the feasibility of a contractor's EAC. For each WBS (Work Breakdown Structure) in a contract, you enter the data necessary to calculate an IEAC (Independent Estimate at Completion) and a FEAC. Once you've entered the required information, CSW: FEAC creates a report to allow you to compare the IEAC and FEAC with the BAC (Budget at Completion) and EAC for the contract.

FEAC is a straightforward program that does one thing well. If all of the acronyms in the preceding paragraph are just alphabet soup to you, you should probably skip these offerings. But if these kinds of projects are your stock-intrade, the CSW is worth a long look.

Version 1.1. \$295. Leckie Associates, P.O. Box 160, Merrimack, NH 03054-0160; (603) 424-7014.

Cost/Schedule Workshop:

Performance Measurement Data Analysis

If tracking the progress of large projects—especially defense contract work—is what you do, this software is for you. PMDA (Performance Measurement Data Analysis) tracks contracts by WBS (Work Breakdown Structure) or OBS (Organization Breakdown Structure) and can produce a variety of analysis reports and graphs so you can track contract performance.

The data you enter includes contract, line-item, and selection criteria; line-item costs; and currency conversion. A few of the reports available are Schedule Variance Analysis, Cost Variance Analysis, and Work Remaining Analysis. Ten preformatted charts can be drawn, and up to ten user-customized charts can be created.

Version 3.5. \$595. Leckie Associates, P.O. Box 160, Merrimack, NH 03054-0160; (603) 424-7014.

Cost/Schedule Workshop:

Responsibility Assignment Matrix

The RAM (Responsibility Assignment Matrix) is a cornerstone of the Cost/Schedule Workshop. RAM can produce project-management matrices, dictionaries, and indexes based on data for each WBS (Work Breakdown Structure), OBS (Organization Breakdown Structure), and Cost Account element in a project.

To use RAM, you enter data into the WBS Dictionary, OBS Dictionary, Cost Account Dictionary, and the Contract Criteria. The Responsibility Assignment Matrix and the Cost Assignment Matrix show relationships among WBS and OBS hierarchies and cost-account locations, responsibility and cost assignments, as well as schedule and cost status.

RAM indexes let you list frequently used information. There's a Cost Account In-

dex, an OBS index, and a WBS index (which complies with the Defense Department's DA-A-3023/M-126-1).

You can format the matrices, dictionaries, and indexes in any font or style, and other formatting options are available, so RAM can produce very attractive, easy-to-read reports. For such a specific-use program, RAM is surprisingly powerful and follows the Mac interface well.

Version 1.0. \$595. Leckie Associates, P.O. Box 160, Merrimack, NH 03054-0160; (603) 424-7014.

BUSINESS BOOKSHELF

LetterWorks

Have you ever wondered how to request verification of EEOC compliance or how to word the termination of your ad agency's services? If you've everneeded help writing a business letter, this is the book for you.

LetterWorks contains 401 business letters organized by subject. Each subject has a brief introduction, and each sample letter has short explanatory notes to help you adapt it to your needs. The book has two indexes, one by letter title and another by subject, so finding the exact letter you want is quick and easy.

LetterWorks comes on-disk with its letters in text format, so any word-processing software can open them (they're Microsoft Word documents if you double-click on them). So once you've found the appropriate letter, you can open the text file and copy and paste any or all of it into your document. LetterWorks' only drawback is its price, but if you write enough business letters, you can justify it.

\$79.95. Round Lake Publishing, 415 Main St., Ridgefield, CT 06877; (203) 438-5255.

Cost Management System

If you have to bid for business and need to do detailed cost estimating or want to keep control of your costs, take a look at CMS (Cost Management System).

CMS is a combination application and database written in FoxBASE+/Mac 2.0, so in spite of being a stand-alone application, it has a few idiosyncrasies that come from its database roots. But CMS also takes advantage of the capabilities of FoxBASE+/Mac to produce a wide variety of attractive and useful reports.

To use CMS, you create a job, which includes job and client information; and sections, tasks, and prices, which are independent units and can be used for more than one job. The ability to reuse sections, tasks, and prices makes repeated similar jobs fast and easy. For construction jobs, the 16 standard CSI divisions are included in CMS as sections, along with associated tasks and example base prices.

Once the job, section, task, and pricing information is entered, you can perform cost estimating with five reports, including a detailed estimate; a time-phased estimate; and direct-cost, combined, and adjusted summaries. To perform job costing, you can copy information from an estimate or create a new job.

You can use CMS to track the progress of a job and its costs, with nine available reports. CMS can also interface with your general-ledger accounting system and exports files in four formats (Satori, SBT, tab-delimited, and standard delimited).

Version 2.10. \$495. Softouch Software, 5200 S.W. Macadam, Suite 255, Portland, OR 97201; (503) 241-1841.

Desktop Help for Excel

Desktop Help for Excel is an Excel 2.2 manual in a DA that offers the same kind of context-sensitive help as Excel does—but without Microsoft's habit of sending you back to the manual for a fuller explanation.

Help Software also markets a developer's version of the DA, so custom help files can be created for any program.

For the typical Mac user who never opens a manual, Desktop Help is an idea whose time has come.

> Version 2.2. \$79.95. Help Software, 10659A Maplewood Road, Cupertino, CA 95014; (408) 257-3815.



Constructimator I

251/2 Constructimator II is an Excel template with associated macros that can be used to semiautomate the job-costing process, but it lacks the power and flexibility of CMS.

Constructimator II has drawbacks. Because the worksheet also serves as a checklist of possible costs, it's large, which makes performance sluggish when you're entering data, unless you turn off automatic recalculation. The documentation is sparse, so you need to understand job costing and cost estimating (as well as Excel).

Constructimator II's biggest flaw is that the worksheet and macros are protected, so you can't customize them or make any changes. Excel 2.2 detected an error in the printing macro, for example. While ignoring the error produced the expected output, it would have been nice to be able to fix the problem. Spend the extra money and get CMS.

\$195. Softouch Software, 5200 S.W. Macadam, Suite 255, Portland, OR 97201; (503) 241-1841.

Construction Project Management System II

CPMS II is a set of Excel templates for residentialand commercial-construction-project management. The main worksheet has three major sections: Bid and Schedule, for setting up cost estimates and assigning completion dates; Cost Control, for comparing subcontractor invoices with the bids from Bid and Schedule; and Payment Control, for keeping track of disbursements for invoices from Cost Control.

CPMS II suffers from the same drawbacks as Constructimator II, but the main CPMS II worksheet is smaller, so performance is somewhat better. Still, this is a high price to pay for locked Excel templates, and Softouch's protection scheme may not fit in with your needs.

\$95. Softouch Software, 5200 S.W. Macadam, Suite 255, Portland, OR 97201; (503) 241-1841.





PRESENTATIONS

DeltaGraph

DeltaGraph is a fantastic value and the best charting and graphing tool around.

If simple 2-D graphs are worth a thousand words, then the dazzling 3-D graphs that DeltaGraph creates are worth a million. This charting and graphing program is a solid package that lets any Mac user produce business graphics worthy of the best high-priced consultant at a fraction of the cost.

WHAT IT IS DeltaGraph can create 22 different types of two- and three-dimensional charts in black and white on a Mac Plus or SE, or using 256 colors (from a palette of 16.7 million colors) on a color machine. Chart types include 2-D line, column, bar, and pie formats, plus 3-D column, area, ribbon, surface, scatter, scatter line, and wireframe. Drawing, text, and blending functions let you add graphics and customize a chart in any way you wish.

DeltaGraph can import its data from tab or comma-delimited text files, and from WKS, SYLK, Excel, and Trapeze files. With a supplied DeltaGraph macro, users can even link an Excel file with a DeltaGraph file, so that any update to the Excel data can be reflected in a Delta-Graph Notebook (the program's name

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DeltaGraph is a terrific 2-D and 3-D charting and graphing package. Its 3-D graphics are easy to create and edit. You can add graphic objects from the tool palette on the left, and you can even save a chart as an Illustrator file for more-sophisticated touch-ups.

for a data file). DeltaGraph can also export graphs in PICT, EPSF, and Adobe Illustrator formats, so sophisticated touchups are easy.

Your graphs are generated from a Notebook, which looks like a multipage spreadsheet that supports simple mathematics and dimensions of 256 columns by 10,000 rows. Up to 20 graphs can be associated with a given Notebook file, with each Notebook having as many pages as memory allows.

Although not as mathematically robust as Synergy Software's KaleidaGraph (reviewed in February '90), DeltaGraph concentrates on graphics and leaves complex math to the user's spreadsheet program. In keeping with its graphics emphasis, DeltaGraph also supports plotters (with the appropriate driver) and film recorders.

HOW IT WORKS Using DeltaGraph starts with the data Notebook. After entering the data into its spreadsheetlike array, you select the information you want to chart (DeltaGraph supports discontinuous selections), and a graph is created after you choose the Plot command from the Chart menu. DeltaGraph then displays the Choose Chart Type dialog

box, which offers three main pop-up menus: Standard, 3-D, and Custom. Once you've selected the correct type and pressed the plot button, the chart appears in a new window. You can change the minimum and maximum for the x, y (and z) values, change the scaling from linear to logarithmic, and change the axis placement by clicking on the chart and select-

ing the Axis command from the Chart menu.

One of DeltaGraph's most innovative features is the Chart menu's 3-D View command. The command produces a dialog box that lets you change the orientation (elevation and rotation) of a 3-D graph. The elevation is the horizontal viewing angle, and the rotation is the vertical viewing angle. You can either enter the values in the dialog box or click on an arrow and watch a three-dimensional box rotate on the screen.

Once a chart is created, you can turn to DeltaGraph's drawing tools to embellish it with draw objects such as lines, boxes, ovals, circles, rounded boxes, polygons, arcs, arrows, and even Bezier curves. Once the graphic elements are drawn in, they can be grouped for easy manipulation. Essentially, DeltaGraph has the combined capabilities of a high-powered graphing package and an object-oriented drawing package.

About the only shortcoming Delta-Graph has is its manual, which does not give enough examples of how each graph is set up and is printed in black and white. It's ironic that a package with such ad-

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DeltaGraph lets you view its 3-D graphs from any angle you choose. You can enter numbers for the specific elevation and rotation, or you can press one of the four arrow buttons and watch the 3-D cube move interactively.

vanced color-charting capabilities would show examples of 3-D charts and color wheels in black and white. DeltaPoint says that that decision was made in the interest of keeping the price down, so although it may look odd, it's not necessarily a bad trade-off.

THE BOTTOM LINE Delta Graph is a solid, excellent package that performs flawlessly. Users looking for the cutting edge in 3-D graphing should get their hands on this program now.

Jeffrey A. Steinberg

Get Info

DeltaGraph \$\$\$\$\$

List Price: \$195.

Published by: DeltaPoint, 200 Heritage Harbor, Suite G, Monterey, CA 93940; (408) 648-4000.

Version: 1.0.

Requires: System 6.0.2 or later. Application Size: 753K.

Compatibility: Mac Plus or later.

WORD PROCESSING

MarkUp

A multiuser editing tool seems like a good idea, but MarkUp isn't.

MarkUp sounds like an editor's dream, but in reality it's just a novelty — and an expensive one at that. Its main problem is a schizophrenic interface that forces you to work in a drawtype environment while editing text. The inconsistent and time-consuming inter-

Edit Styles: Tent

MarkUp is a multiuser editing tool with

a poorly designed interface. Its editing

overlays protect the original document,

but merging even two overlays, as

document virtually unreadable.

shown here, can render the original

Page 2 of 4 MARIATINGS

face is frustrating enough to make anyone give up after five minutes and return to using an old-fashioned red pencil.

WHAT IT IS

MarkUp is a multiuser editing and review application that lets you put individuals' comments on transparent overlays that leave the original documents created in another applica-

tion intact. These documents can come from word-processing or page-layout programs, graphics packages, and so on. The document owner accesses the overlays, separately or merged into one document, and adds the changes to the original. It sounds less painful than it is in practice.

MarkUp does have some good features — its security and organizational functions are first-rate; it can import documents from nearly any Mac application; it allows reviewers outside an organization to add overlays; and, best of all, it lets you put the document on a server so that reviewers can make changes (and view each other's changes) simultaneously. Unfortunately, its primitive interface eclipses its assets.

HOW IT WORKS The tear-off tool palette includes standard draw tools, plus popup notes for detailed comments. A separate palette of proofreaders' marks is

accessible via an Option-click, and any one of eight colors can be applied to everything except framed and shadowed text boxes (text can be colored). Although the tools themselves are adequate (in fact, the shaded rectangle is an excellent highlighter), using them is a cumbersome process.

For example, double-clicking on a tool in the palette brings up the Attributes menu (color, thickness, screen percentage, or shape). You can set default attributes, but when you want to make changes, you can't automatically apply your menu selection by double-clicking on it. Instead, you have to click on the new attribute and then on OK. This makes simple tasks ponderous, and it's inconsistent with most other draw programs, which apply

OK with a double

You can double-click on the text tool all you want, but to get its attributes, you have to go up to the Options menu. Worst of all, the Undo command works only with a cut, copy, or paste.

Although popup notes look like oversized text boxes, they're really an overlay layer with the same

attributes as that layer. To write something in these notes, you have to click on the tool palette, place the note marker on the overlay, open the note, open a text field in the note, and finally add your message. Ouch!

As for the proofreaders' marks, their pop-up menu stays on-screen only while you're selecting a tool, so you have to open it again and again if the document needs a lot of correcting. In addition, the marks are so tiny, they're practically invisible.

Because you can edit only one page at a time, you can't scroll through a document. If you want to skip pages for a quick comparison, you have to save all your changes on the current page (which you may not want to do until you've looked at another page) or not save any of your changes (which you probably also don't want to do).

MarkUp doesn't make rewriting easy

or obvious. In an overlay, text is inactive, so you can't alter it. To make it active so you can revise it, you have to go through a complex routine involving closing all overlays, extracting the text, pasting it into the Clipboard or Scrapbook, and then pasting it into a text field on a popup note. And since MarkUp is page-based, you have to keep coming back to

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MarkUp's proofreaders' marks are selected from this palette, which you invoke with an Option-click. The marks are tiny, and you have to reopen the palette every time you need to make a correction.

this note, which means saving, returning to the page with the pop-up note, saving, and so on.

Besides providing a couple of paragraphs in the introduction, the manual, which is otherwise pretty good, almost completely neglects to explain how to add the reviewers' final comments to the original document in its original application. MarkUp needs a section in the tutorial devoted to the steps in the process of merging comments into the original.

THE BOTTOM LINE If all you want is organization and security for your shared documents, MarkUp might be worth it. But if you want a quick and efficient way of managing your editing, this isn't it.

— Victoria von Biel

Get Info

MarkUp \$\$1/2

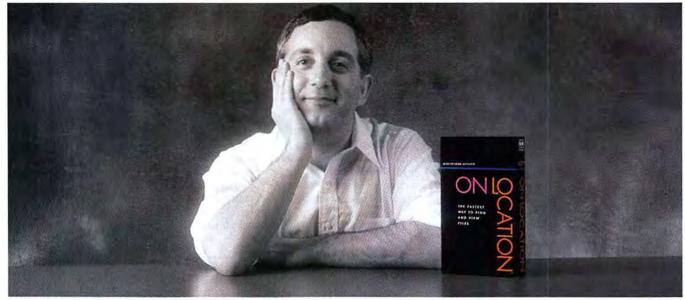
List Price: \$245 (one user), \$495 (two users), \$995 (five users). Published by: Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301; (818) 991-6540.

Version: 1.01.

Requires: System 6.0 or later, 1 megabyte, and Mac II or SE/30

for color.

Application Size: MarkUp, 226K; MarkUp Administrator, 78K; MarkUp Reader, 85K; Document Creator, 92K; MiniMarkUp (for remote users), 154K. Compatibility: Mac Plus or later.



Mitch Kapor, chairman, ON Technology.

"Before you can ask, "Where's my file?" you'll be reading it."

"It happens all the time:

You sit down, ready to work. Then, because you have hundreds of files on your hard disk, you waste time looking for the file you want. If you find it, you have to run a word processor to see what's inside.

That's crazy. And that's exactly why we created the On Location™ desk accessory: to make finding and viewing files as fast and simple as possible.

The fastest way to find and view files

You don't have to remember file names to use On Location. Just type in a word or two from the file you're looking for. So if you need the letter you wrote to John Simmons about the insurance policy, type 'Simmons' and 'insurance.' Within seconds, On Location scans its index of all the text on your hard disk and finds your letter.

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Number of files on your disk

And you don't have to open your word processor to read the file. Double-click on the file name, and you'll instantly see the text, including the original fonts and styles for word-processing documents. You can also copy text to the clipboard. Or launch the file directly into its application program.

If you do remember a file name (or part of one), you can type that in the search window. On Location starts looking as you type, and often finds the file before you finish.

The story behind the speed

On Location is so fast because it stores an extremely compact index of your hard disk. (This index usually takes up less than two percent of the disk.) As you save and move files, On Location automatically makes note of the changes. Then, when your Mac is idle, On Location indexes the name and text of these files.

We call that steady, silent process 'background indexing,' and On Location is the only Mac product to provide it. Background indexing means that On Location is always up-to-date and ready to work when you are.

It took us months to fine-tune On Location. But it's only going to take you a few minutes to appreciate On Location's power—and to learn how to use it.

On Location offers unmatched speed and convenience

- find a file by typing its name or words it contains
- search an entire hard disk in seconds
- view and copy text from files, without opening applications
- see actual fonts and styles for leading word processors, including MacWrite II,* Microsoft* Word, WriteNow,* and WordPerfect*
- directly open files and application programs
- move, copy, rename, and delete files
- find text in most files, including HyperCard,*
 PageMaker,* and Microsoft* Excel
- search for all forms of a word ("fuzzy matching")
 Requires Macintosh^h Plus or above, with a

Requires Macintosh* Plus or above, with a hard disk and System 6.0 or above.

One-year guarantee

We're proud of On Location. All products should work this way. And all products should come with this guarantee: if you're unhappy with On Location for any reason during the first year you own it, you may return it for a full refund.

Try On Location. You have nothing to lose—and a lot to find."



MULTIMEDIA

ColorSpace Ili/FX

Mass Microsystems has brought live 24-bit video to the Mac screen.

Multimedia is more than just a hyperhip buzzword. There actually are some useful products available on the market. The ColorSpace IIi and Color-Space FX boards from Mass Microsystems are pioneers in desktop multimedia, or more precisely, desktop video. The boards and accompanying software give video producers the ability to add special effects, titles, and graphics to live video images for display on an RGB or NTSC monitor, or output onto videotape.

WHAT IT IS The ColorSpace FX board converts composite video signals (NTSC or PAL) to RGB for display on a Mac monitor. It also processes the kinds of special effects you commonly see on the

opening credits of TV news shows, such as spinning and shrinking video windows containing live-action video. The video input can be from a camera, videotape player, or videodisc.

The ColorSpace III lets you mix live video with computer graphics so you can add titles to video presentations. The board's three software-switchable video inputs can be selected at any time. The III is also a versatile video-display board that outputs RGB signals to various Mac monitors (including Apple's) and sends composite signals to an NTSC monitor. The III can be run without the FX, but only if you display the video on an NTSC monitor.

A typical ColorSpace presentation might consist of a videotape or videodisc and a computer-graphics application created with HyperCard, SuperCard, Authorware Professional, or MacroMind Director Interactive. For HyperCard and SuperCard developers, Mass Micro includes a stack with XCMD and XFCN resources to control special effects. Demo HyperCard stacks show what can be done, but don't expect to accomplish much unless you know something about HyperCard programming. For anyone willing



The ColorSpace FX/IIi combination lets you view 24-bit live video on your Mac monitor. The boards work, but the software is badly designed. The MacTV application lets you view live video in a window, and the Desktop Video DA lets you set a hue for video seethrough, or chroma-key.

to sign a nondisclosure agreement, Mass Micro offers a free developers' kit that lets you into the source code.

The boards also come with several useful utilities. An application called MacTV can be used to watch a football game in a window on your Mac instead of on your TV, but it could also be used more practically to monitor a private stock-quotation channel while you worked on a spreadsheet. Because the hardware completely bypasses the Mac CPU, the video in MacTV (or any other application running with the ColorSpace Ili/FX combo) runs smoothly, without slowing down any normal Mac applications or operations.

A Digitizer DA lets you digitize a video frame (as a frame grabber does) and store it as an 8- or 32-bit color PICT2 file. Although the IIi board displays live video in 24-bit color, it displays graphics in 8-bit color only, so you can't display the image in full color once it's been digitized.

The Desktop Video DA lets you key the video to show through any single color on the Mac screen when video and Mac graphics are combined (a process commonly called chroma-key). This means you can limit the video to a window or to any lettering or shape that's the color you've picked.

Unfortunately, turning off the chromakey mode also turns off a handy one-inch view box in the DA window. Other abilities include completely replacing Mac graphics with video, although getting back to the desktop is not very elegant, requiring one of several two-step keyboard commands.

HOW IT WORKS Although the functionality is certainly there, the ColorSpace Hi/FX pairing shows a few signs of having been rushed to market too soon. The interface's quirkiness would be easier to handle if the documentation were better. The thin, poorly organized manual contains errors in text and diagrams and is incomplete, which makes installation harder than it should be. If there's a conflict between what seems right and what the manual says, you're probably better off going with your instinct.

In addition, Mass Micro reported that the initial manufacturing run of Color-Space IIi boards being sold at press time were rebuilt from older ColorSpace II boards. This included the replacement of old parts and the addition of jumpers and new parts. This manufacturing method could prove troublesome for long-term reliability — the IIi board we received showed imperfect workmanship, with below-spec hand-soldering and heat-shrinking. However, the board did work perfectly during the time we reviewed it.

THE BOTTOM LINE Overall, we can recommend the ColorSpace Ili/FX combination—especially if you're a developer exploring interactive video. It delivers live-video-overlay functionality, as advertised. However, a little time might give us a more complete package.

— John Rizzo

Get Info

ColorSpace III and ColorSpace FX \$\$\$\$

List Price: ColorSpace IIi, \$2,299; ColorSpace FX, \$3,499. Manufactured by: Mass Microsystems, 550 Del Rey Ave., Sunnyvale, CA 94086; (800) 522-7979 or (408) 522-1200. Compatibility: Mac II series.



Introducing the WACOM Super Digitizer.

Pressure-sensitive. Cordless. Light-weight.

"Wacom tablets are the top choice for artists."* "A dream come true!" "The lightest, most comfortable pointers around." Such have been the reactions of graphic artists and other users to Wacom's new Super Digitizer (SD) series.

Understandably. For these new state-of-the-art systems have no cord,

no battery, no magnets. So the stylus is ultralight, weighing only 1/3 ounce (11 grams), making it as light and natural to use as a ballpoint pen. No frustration in untangling wires either.

Best of all, **pressure-sensitive** input. Now your artwork can reflect each creative stroke. Use Deneba's latest UltraPaint TM or other software to vary brush thickness, colors, airbrush

density and gray scaling. These and other special effects are varied by the pressure you apply on the stylus. No wonder artists and designers across the country are raving about the creative, responsive feel of Wacom's Super Digitizers.

Wacom. Specializing since 1983 in the world's finest cordless digitizers.



Wacom Inc.

West 115 Century Road, Paramus, NJ 07652 Tel: (1) 201-265-4226, (1) 800-922-6613

Wacom Computer Systems GmbH

Hellersbergstrasse 4, D-4040 Neuss 1, West Germany Tel: (49) 02101-16001, Fax: (49) 02101-101760

Wacom Co., Ltd.

4-1-12, Ikebukuro, Toshima-ku, Tokyo, 171 Japan Tel: (81) -3-985-0097, Fax: (81) -3-985-8636

* Reprinted from PC Magazine, November 28, 1989. Copyright 1989, Ziff Communications Company, UltraPaint is a trademark of Deneba Systems, Inc. Macintosh is a registered trademark of Apple Computer, Inc.

Please circle 69 on reader service card.

PRINTERS

PLP II

A bargain laser printer gets even better.

When it introduced the Personal LaserPrinter in 1987, GCC Technologies irreversibly changed the landscape of laser-printer pricing — from skyscrapers to affordable housing. The PLP philosophy is simple: Put 300-dpi laser-printing power into the hands of individual users who don't need networking capability or PostScript output. (The company later introduced the Business LaserPrinter option for people who need those capabilities.)

The PLP II is a completely redesigned and upgraded edition of the original, inside and out, with several significant improvements (as well as a few pleasant bonuses). The best news is the price: The PLP II lists for \$1,399, and you can probably find it discounted for substantially less. Almost as good is the news that the troublesome — and messy — toner cartridge has been replaced by a sealed mechanism. Assembly is a clean-hands operation, and a painless one at that.

One of the nicest new features of the PLP II is that it automatically powers down to a low-power, nearly silent "sleep" state whenever it hasn't been used for a user-definable period of time; it takes only a few seconds to warm up when you're ready to print again.

The software also includes a handy envelope-printing and address-database DA, a spooler, kerning controls, and support for printing nearly edge to edge.

The PLP II ships with a basic collection of six Bitstream outline fonts and also supports the Adobe Type Manager. A new front panel has controls and indicators that do everything from manual printing to telling you when it's time to change the consumables.

On the negative side, printing is, if not slow, no speed demon. The Oki Electric

OL-400 laser engine is rated at a respectable (for printers in this price range) four pages per minute. But complex pages can tie up your Mac for many minutes, although you can speed things up by adding RAM to either your Mac or the printer (the PLP ships without any internal RAM but can be upgraded to 1 megabyte).

The PLP II is an outstanding value and an excellent choice for anyone who wants a Mac laser printer but doesn't want to spend the big bucks for an Apple model.

- Jon Zilber

Get Info

PLP II tttt

List Price: \$1,399.

Manufactured by: GCC Technologies, 580 Winter St., Waltham, MA 02154; (617)

890-0880.

Requires: Mac Plus or later;

hard-disk drive.

<u>BetaWatch</u>

Products on the Horizon

PAGEMAKER 4.0 incorporates all the color capabilities of PageMaker Color Extension and adds long-awaited features

for word processing, typography, and large documents. A spelling checker and a searchand-replace capability

are finally available via the Story Editor, a special window that lets you do rapid text editing and then pour the text back into the layout. Nifty new features include in-line graphics and paragraph rules (both of which move with the text) and text rotation (but only in 90-degree increments). A separate Table Editor utility can generate tables that are imported into PageMaker as PICT files. Enhanced typographic features include kerning to within .001 of an em; five levels of tracking; and improved

control of hyphenation, widows, and orphans. Type sizes now range from 2 to 650 points, and you can adjust type sizes and leading in .01point increments. A new Set Width control condenses or stretches type from 5 to 250 percent. The new version supports document lengths of up to 999 pages (given enough disk space). A Book feature lets you associate multiple documents for chain printing and generating tables of contents and indexes (which can have up to three topic levels). The Links dialog box shows every text and graphics file that's been placed into the document and is automatically updated - very handy if you print documents at a service bureau. On the minus side, PageMaker 4.0 can still open only one document at once, and it has no numericalscaling or internal color-separation abilities.

PageMaker 4.0, price and upgrade policy not set at press time. Aldus Corp., 411 First Ave. S., Seattle, WA 98104; (206) 622-5500.

ETA: Second quarter 1990.

ALDUS PREPRINT is a color-separation utility that can handle entire files from either PageMaker Color Extension or PageMaker 4.0, including TIFF and EPSF images. (Color PICT files are not supported.) This midrange color solution stresses ease of use, so it doesn't offer all the features of high-end products. It does offer limited editing of TIFF images, however,



including global tweaks for sharpness, lightness, contrast, and color saturation. On the output end, you can print composites on a laser printer or create film separations — including masks — on a Linotronic. The Print options have several levels, depending on the user expertise. You can override the defaults and select everything — from screen angles and ink overprints to dot-gain compensations, total ink coverage, and paper stock. (Aldus PrePrint replaces Aldus Separator, the color-sep utility originally slated for release with PageMaker Color Extension.)

Aldus PrePrint, \$495. Free to Color Extension owners. Aldus Corp., 411 First Ave. S., Seattle, WA 98104; (206) 622-5500.

ETA: Second quarter 1990.

The next best thing to a new Mac is a Power User's Memory Upgrade! 1MB SIMMs Modules... Now only \$95 each.*

Now you can unlock the awesome power in your Mac and use it to it's full potential with a Power User's Memory Upgrade from MacShopper. By replacing the existing 256K memory chips with our powerful 1MB memory modules you can bring more brain power to your Mac than you thought possible.

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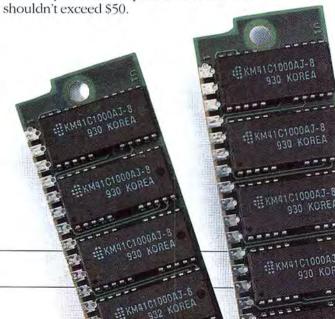
WHAT DO I NEED?

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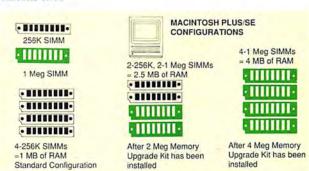
step" instruction manual. The whole job should be complete in less than one hour. You'll need a simple tool kit which is available for just \$15.

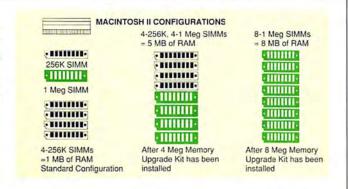
If you prefer, you can have a computer store install your SIMMs for you. Their service technicians have the necessary tools and expertise. The total cost



The Mac Plus and Mac SE have four available slots on the motherboard, which originally contain four 256K SIMMs modules - totalling 1 megabyte (1MB) of memory. To upgrade, you can replace each 256K module with a 1MB module, but you must do this in pairs.

Replace two 256K modules and you will have a total of 2.5MB of memory. (That's the two new 1MB modules plus the original two 256K modules.) Replace all four modules and you'll have 4MB. (You should save the 256K modules for later use if you want to pass your Mac on to





The Mac II, IIx, IIcx and SE/30 each come with a total of eight slots. The standard configuration has four 256K SIMMs modules, or a total of 1MB. Here, memory must be upgraded in multiples of four. This allows for expansion from 1MB to 4MB, 5MB or 8MB.

Remove the four 256K modules and replace with 1MB modules and you have 4MB. Leave the original modules and add four 1MB modules and you get 5MB. Removing the original modules and adding eight new 1 MB modules will bring you to 8MB of memory.

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The system doesn't respond any faster anyway. But you can always take your memory chips with you when you move on to a new Mac, so there may be an advantage to speed at a later date.

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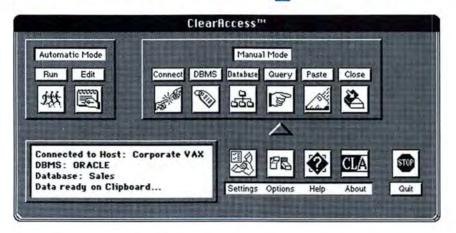
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GRAPHICS

Super 3D and Swivel 3D

These excellent 3-D tools complement each other perfectly. Serious 3-D artists should get both.

If you've ever created a 3-D scene using a conventional drawing program, you know how hard it is to edit or render that scene from a different viewpoint. Two veteran 3-D programs — Super 3D and Swivel 3D — can relieve that drudgery. Both have comfortable interfaces and have been upgraded with added functionality and speed.



Super 3D's interface makes it a good choice for artists migrating from 2-D programs. These Super 3D objects started as outlines, which were spun (the cup and the urn) or extruded (the urn's handles and the book). SpinWheel scroll bars help you handle objects and orbit the world. The drawing tools and camera control palettes can be moved or hidden. Multiple cups and pencils are clones of their respective master objects. The background is an imported painting.

Common Ground

Super 3D and Swivel 3D have objectcreation environments that are relatively easy to learn, even though they work in radically different ways. Both let you move, resize, and free-rotate objects or specify their precise location, scaling, and orientation numerically. Zooming in and out is simple with either program, although Super 3D offers more ways to change your viewpoint.

Extruded and lathed objects can be created with varying degrees of smoothness, and both programs can form irregular shapes by connecting a set of differently shaped cross sections.

You can access up to 256 colors to shade your objects, but each program renders its colors slightly differently. Super 3D's dithered-coloring scheme can produce a wide range of apparent colors. Swivel 3D's solid-color shading is more pastel, and its color range for a given model is more limited. Either program can import a color picture as a backdrop or as a template for manual tracing.

Animation is key to both programs, and producing tweened animation sequences is relatively easy. The animation viewpoint can be assigned to an object that acts as a flying camera, and the resulting 3-D movies can be saved as PICT files and exported to other programs such as MacroMind Director, VideoWorks II, Studio/1, and SuperCard. Super 3D's animation interface makes you use a pop-up dialog box each time you shoot a manually arranged key frame. Swivel 3D's animation interface is painless and intuitive. Its acceleration/ deceleration options and smoothing of angular motions are a big help in achieving a natural look.

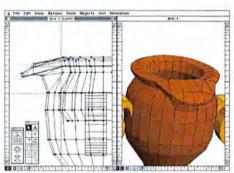
Super 3D

Super 3D's work environment is a familiar object-oriented drawing scheme with standard tools for creating basic shapes. Your 3-D objects begin as clicked-out 2-D outlines that gain a third dimension through extrusion or revolution. You can also use an imported PICT outline as a starting point. Another way to create depth is to use the powerful Sweep Surface function, a souped-up extrusion process that progressively rotates and scales a cross section. Super 3D lets you construct objects in full context, so you can use nearby shapes for reference and precise matching.

You can have multiple views of a world, and each view can be in any rendering mode with any lighting settings. This can help with tricky positioning and reshaping chores. In any view, you have four independent light sources.

The master-object system can simplify

building, and later implementing major changes to, a model. A document can have an unlimited number of master objects, each in its own window, and you can use master object copies many times in one model, without adding much to the size of the document. Moreover, any change you make to a master object is reflected throughout the model.



Super 3D's vertex-level shape sculpting lets you reshape objects by repositioning their vertices. Its reshaping system is very workable, but you can't see the selected handles in simultaneous views, which makes some reshaping work more difficult than it should be.

Super 3D has three solid-rendering modes: Faster, Better, and Best. Hiddensurface problems occur frequently in the Faster and Better modes and occasionally in the Best mode.

For flexibility, Super 3D can export a scene as an object-oriented 2-D snapshot in PICT or EPSF format, but the fineness of detail depends on the current rendering mode: In Faster, object facets are filled polygons; in Best, each facet is composed of many thin lines — thousands of them in a large image.

You can save true 3-D models in VersaCAD format. They can also be saved as text, which produces a list of short instructions for creating the 3-D model that can be imported into other programs for analysis or modification.

Swivel 3D

The key to Swivel 3D's appeal is its excellent rendering speed, presentation accuracy, and unique ability to link 3-D elements in a machinelike structure. These qualities make it a good brainstorming tool.

Its object-manipulation interface is clean and natural. By using the mouse plus the Shift, Option, and Command keys, you can quickly grab, move, resize,



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REVIEWS

and reshape objects. Grids for both attitude and position help objects snap into place without tweaking.

All Swivel 3D objects are constructed in a special view, with the main scene out of sight. You start defining an object by drawing its cross section. A bat, a ball, or a coin, for example, all have circular cross sections. Tracing out the side and top views determines how the basic cross-sectional shape will be resized and distorted to form the final object. You can move, add, or remove points along the three outline views at any time. It's a powerful shaping system that sounds simple, but what an object's three views should look like isn't always obvious - and you'll definitely have to experiment.

Swivel 3D lets you link items in several ways. Every link has a "parent" object and a "child" object. Links can be stiff, as in conventional groups; ball-jointed, in which the components pivot but don't separate; or rubbery, in which the child elements move and turn independently but aren't left behind when the parent object moves. You can even

Get Info

Super 3D \$\$\$\$\$

List Price: \$495.

Published by: Silicon Beach Software, 9770 Carrol Center Road, San Diego, CA 92126; (619) 695-6956.

Version: 2.04.

Requires: System 6.0.2 or later; two 800K floppy drives; 2 megabytes and hard-disk drive recommended.

Application Size: 457K. Compatibility: Mac Plus or later.

Swivel 3D \$\$\$\$\$

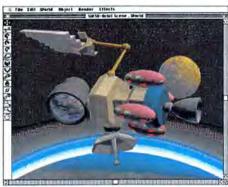
List Price: \$495. Published by: Paracomp, 123 Townsend St., Suite 310, San Francisco, CA 94107; (415) 543-3848.

Version: 1.1

Requires: System 6.0.2 or later; two 800K floppy drives; 2 megabytes and hard-disk drive recommended.

Application Size: 242K.

Compatibility: Mac Plus or later.



Swivel 3D objects can cast true shadows on each other. You can also import and project a different color graphic onto the surface of each object to give the appearance of texture or detail. Projections remain with their objects and follow normal rules of distortion and perspective. This imported color painting is a key element in the illusion.

specify how much freedom each child object is allowed relative to its parent—a door might swing no more than 90 degrees, for example, or a sliding part might travel up to 1.5 inches.

Each Swivel object can now include up to eight fields of data for storing part numbers, types of materials, and so on. The data are exportable to spreadsheets and help combine the jobs of design and materials accounting. Swivel 3D can export its worlds as 2-D snapshots in both bitmapped and PICT, as well as EPSF object-oriented formats — including a fully editable and well-shaded version for Illustrator 88. Any projected images are omitted from the object-oriented exports.

Separate but Equal

Super 3D's working style makes it a good choice for a broad range of users, especially those just migrating from 2-D programs. Its vertex-level editing gives you precise control over every facet of your objects, and its master-object system can save your sanity when you need to make global changes. For general-purpose 3-D, Super 3D is a good choice.

Swivel 3D's speed, shadows, image projection, and easy animation make it an ideal artist's tool.

Its exports make great starting points for enhancement in color paint programs and its mechanical linking talents take it into basic model making and interactive demonstrations.

Both programs have much to offer, yet each lacks important features that the other has, so if you're a serious artist, get both. The money you spend now will be great frustration insurance.

Salvatore Parascandolo

PERSONAL FINANCE

Checkwriter II

Checkwriter II tries to knock off Quicken but just misses the target.

With the success of Intuit's Quicken, it was inevitable that another company would enter the personal-finance/small-business market with a similar product. Aatrix Software, well known for its popular payroll package, has set its sights on Quicken with its Checkwriter II system. Is Checkwriter II a Quicken-killer? The answer is no.

WHAT IT IS Checkwriter II is a welldesigned, highly functional checkbookbased personal or small-business accounting system, but the program doesn't have the same highly refined feel of Quicken. Checkwriter II places your checkbook at the center of your financial universe. By entering payments and receipts and assigning them to a type of ledger account, you get a full general-ledger system that uses your checkbook register as the point of entry. Checkwriter II does have an advantage over Quicken in that it can be used as both a DA and an application.

You can keep an unlimited number of Checkwriter II ledgers for your different checking accounts, and each account can support a different format for printing checks.

Checkwriter II handles all types of bank fees. Any kind of bank fee can be

REVIEWS

entered directly into the check ledger. For estimating balances, all account balances can easily be viewed onscreen. Checkwriter II stores voided check numbers, as well as the information originally contained on them. leaving a record for audit-trail purposes. Taxdeductible checks. which are put into their own ledger account, can also be viewed separately.

Following in what is

becoming a tradition of Mac-based accounting systems, Checkwriter II allows you to combine multiple fonts and any graphic that can be cut and pasted through the Clipboard. Aatrix provides a form for ordering blank checks from Deluxe Computer Forms and Supplies, but Checkwriter II supports checks from any forms printer.

Checkwriter II supports all kinds of recurring payments and deposits and reminds you when those checks are due (you have to tell the system to print the checks). The number of budget categories is unlimited, as is the number of payee names and addresses Checkwriter II can store. If you choose not to print your checks with the system, you simply enter the information through the register to use Checkwriter II's record-keeping ability.

HOW IT WORKS The benefit of using Checkwriter II is that it painlessly organizes your financial information by monitoring how you receive and spend funds. Checkwriter II summarizes your financial activity into eight reports: income versus expense (a profit-and-loss statement), budgeted versus actual expenditures, recurring payment or deposit list, cash-flow projection, tax summary, check-ledger summary, budget-type summary, and uncleared checks. Checkwriter II can also present much of your financial information in pie, horizontal-bar, or vertical-bar charts.

A powerful feature is Checkwriter II's search report. Using any keyword criteria, you can link all your related transactions, which makes organization easy. The search report links memos, descriptions, dates, or amounts. These four criteria can be used alone, or in combination,

		Check I	edger ===			
NUMBER	DATE	DESCRIPTION OF TRANSACTION	PAYMENT	1	DEPOSIT	BALANCE
100	11/15	Pete Smith	VOID			6879.00
101	11/15	Northern States Power	55.00	\boxtimes		6824.00
102	11/15	Cass Clay Creameries	15.00	\boxtimes		6809.00
103	11/15	Silverman's Clothing	78.00	\boxtimes		6731.00
104	11/15	Fargo Forum	25.00			6706.00
	11/15	Apple Computer, Inc.			125.00	6831.00
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Checkwriter II is a personal-finance program that uses your checkbook register as the center of your financial universe. In the Examine Ledger mode, you can edit transactions, void checks, and balance your checkbook.

Checkwriter II
lets you build a
list of recurring
charges or
addresses and reminds you when
it's time to make
a payment. It
can't print the
checks automatically, however.

Check Number:	1005 "Paperless" transaction %T
Date:	11/14/89 Edit other fields %F
Pay to the order of:	Landlord
Check amount:	300.00
Memo:	Rent
	In-this
☐ Print address on t	
	he check © Recurring Charges: O Addresses
Print %P %N	he check ® Recurring Charges: O Addresses New >>> Amoco Rent
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to produce detailed reports.

Checkwriter II makes good use of the Mac interface and offers well-designed documentation. The on-line Help system is complete but a little onerous to use. Checkwriter II can import or export information using simple text files.

Overall, as a stand-alone product, Checkwriter II does an admirable job. The system is easy to install and use and definitely adds value. It's not, however, the Quicken-killer that Aatrix wants it to be. Quicken's user interface and documentation still hold an edge, albeit a smaller one than they did over the original Checkwriter.

Quicken runs more smoothly than Checkwriter II, and with its interface into MacInTax, Quicken fleshes out as a more comprehensive system. Add to that Quicken's inherent tax-itemization capability, and it definitely offers more for taxes, which is usually the requirement of a home finance package. Quicken can also automatically batch first-of-themonth recurring payments and check

prints, a valuable feature Checkwriter II doesn't have.

On the other hand, Quicken can't run as a DA, doesn't offer graphics as Checkwriter II does, and requires special check stock. All three of these are important improvements for Checkwriter, but they're not enough to unseat Quicken.

- Ken Landis

Get Info

Checkwriter II ***

List Price: \$59.

Published by: Aatrix Software, P.O. Box 5359, Grand Forks, ND 58206-5359; (800) 426-0854.

Version: 2.0.5.

Requires: Two 800K drives; hard-disk drive recommended. Application Size: Application,

192K; DA, 106K.

Compatibility: Mac Plus or later.

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UltraDrive 100 S.	\$1299 \$1149
UltraDrive 175S .	\$1799 \$1699

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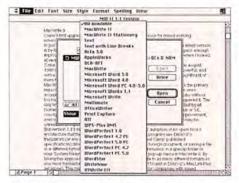
AD# 021034

WORD PROCESSING

MacWrite II

MacWrite II's first upgrade makes it a great choice for mixed working environments.

In just under two years, I've seen three packages called MacWrite, and the latest version is by far the best. MacWrite II version 1.1 isn't a major



MacWrite II's adoption of an architecture that lets the program use DataViz's translators directly (the MacLinkPlus set was installed here) allows MacWrite II to read and write in a variety of formats and makes it an ideal word processor for mixed environments.

upgrade, but it does pack enough improvements and new features to earn that extra half mouse I withheld when I looked at version 1.0 a few months ago.

Because this is essentially a minor upgrade, all my positive comments from the August 1989 review still apply. MacWrite II is an excellent program — it's easy to use, is powerful, and has a terrific interface. The most significant negative aspects, thankfully, have been fixed.

MacWrite II version 1.0 was a dog on 68000-based machines, and that is the primary reason it was denied a higher mouse rating. Formatting and scrolling speeds are acceptable, but even an average typist can outtype the display without too much effort. Version 1.1 has addressed the problem but not totally conquered it. The display speed is much better, but the overall feel is still slightly sluggish. A

fast typist (someone in the 80-word-perminute range or faster) working on a Mac Plus or SE could probably still outtype the screen. This is a significant improvement, nonetheless, and considering the amount of screen information the program supports, it may be unrealistic to expect anything faster.

But version 1.1's most significant improvement is Claris' adoption of an open-hooks architecture that the publisher calls XTND. It lets the program use Data-Viz's MacLinkPlus Translators (or any other developer's translators that meet Claris' published specifications) directly from a pop-up menu. Opening a foreign document or saving a file in a different

format is easy: Just place the appropriate translator that comes with MacWrite II in a special folder in your System folder, and that translator will appear on a pop-up menu in MacWrite II (adding the MacLinkPlus Translators requires a slightly different procedure you must put the MacLinkPlus Translators file into the same folder as MacWrite II). By taking this approach, MacWrite II can now read and write to as many different formats as you have translators (at last count, you could get more than 100 in DataViz's MacLinkPlus set alone). This makes MacWrite II an excellent choice for companies that are using PCs, Macs, and even mainframes.

Claris has also added several small but welcome refinements. For example, version 1.1 now has a Go to page option — although surprisingly, it can't be accessed with a menu command, but requires a Command-key combina-

tion or a double click on the current page indicator (shades of Word 3.0!). You can also now view the Font menu in the standard System font (Chicago) with an Option-select (the exact opposite of the way this is done in any other program if you use Suitcase II), fractional widths are supported as a preference, and window settings are saved with a document.

MacWrite II still has a few minor annoying features, such as being able to save a file to a different format only with the Save As command, an inflexible spelling checker (I'd like to be able to turn the suggestions list off), and no "keep lines together" option to prevent paragraphs from being split across pages. But these are small quibbles. With its improved performance on 68000-based Macs and the addition of its powerful translators, MacWrite II is an excellent balance of power and simplicity. It's a great choice, both for people in mixed environments and for anyone who wants a powerful, easy-to-use word processor and doesn't need the specialized features such as style sheets, tables, and interapplication linking that Word 4.0 offers.

- Russell Ito

GRAPHICS

Origins

Origins is a terrific piece of CAD programming, but a little-less-than-terrific CAD program.

Origins is Deltasoft's first 2-D drafting and 3-D rendering CAD (computer-aided design and drafting) program. It's an incredible piece of code, but as with most first tries, it has more than its share of rough edges.

WHAT IT IS Origins uses a unique approach to building objects that Deltasoft calls Point Orientation. Instead of drawing objects, Origins draws each object as a collection of mathematically independent points, any one of which can be used as a handle for rotation or reshaping. Origins conforms to the spirit of the Macintosh Human Interface Guidelines, but Apple has never specified standard ways to create and manipulate 3-D objects on a 2-D screen. Origins takes a

Get Info

MacWrite II \$\$\$\$1/2

List Price: \$249.

Published by: Claris, 5201 Patrick Henry Drive, P.O. Box 58168, Santa Clara, CA 95052-8168; (408) 987-7000.

Version: 1.1.

Requires: Two 800K drives and System 6.0 or later; hard-disk drive recommended.

Application Size: 452K.
Compatibility: Mac Plus or later.

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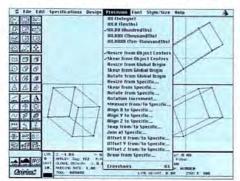
Start Up

REVIEWS

multiwindow approach, with fixed Front, Side, and Top views, plus an optional viewing window that allows free rotation of the observer's viewpoint. Any window can be expanded to fill the screen, but only one file or "design" can be open at a time.

Origins can display 3-D wireframes or rendered solids with optional shading. Some competing programs allow multiple light sources, but Origins models only the simplest case — the light is attached to the observer like a miner's headlamp. You can save renderings in PICT2 format for export to other programs. The 8-bit-color version of the program (which we reviewed) uses the standard Macintosh color-picker dialog box; the monochrome version, available separately, provides a wide range of fill and hatch patterns.

Origins is packed with a cornucopia of features: There are 45 tool icons and eight menu-bar categories — some menus pull down to the bottom of a 13-inch screen.



Origins is a 2-D drafting and 3-D rendering CAD program with an unusual interface. It uses three views (top, front, and side) to build a 3-D object. It is reasonably fast, but its biggest weakness is its interface. The plethora of palette tools and menu choices is overwhelming.

The cursor changes shape — often subtly — to indicate the current tool, which can be confusing and irritating, especially if you're working on a large monitor on which the cursor is just a tiny speck on a vast work area. For precision keyboard entry of coordinates and dimensions, you bring up a dialog box by simply pressing the Enterkey while performing any drawing operation.

Deltasoft's Bezier sculptured-surface tool lets you create a mesh of connected points that can be pulled and stretched into any shape.

HOW IT WORKS

Although Origins makes it easy to create solid objects, it's impossible to drill holes through them. High-end CAD programs support Boolean operations on solids — you can add, subtract, and intersect them in various ways. There is no way to do this in Origins.

This reflects a problem with many CAD programs — they're excellent tools for creating designs that can't be realized. Origins is

great for designers who think like mathematical topologists — but engineers need software that thinks like a machinist, and architects need software that thinks like a construction worker.

Deltasoft is now developing Origins-Solids, an add-on solid-modeling package that works with Origins, as well as with IGES and DXF translators, plotter drivers, and other modules.

A common problem with CAD software is 3-D vertigo. After a series of rotations, pans, zooms, and transformations, a user can get lost in space. The 3-D rotation tool in Origins is very intuitive— a floating palette resembling a TV remote control, with buttons for pitch, roll, yaw, zoom, and pan. But it's still possible to send your design off the edge of the screen, with no easy way of bringing it back.

The well-illustrated manual fills more than 360 pages, but it is repetitious rather than instructive. The same boiler-plate text is used to explain one tool or function after another. It also wastes space extolling the uniqueness and power of the program—a judgment that should be left to users. Deltasoft includes a "getting started" booklet and a quick-reference card, but no tutorial. A HyperCard stack documents the tools and functions, but it's not enough. A program this complex needs a tutorial.

Written entirely in assembly language, Origins' monochrome version is designed to run on a minimally configured Mac 512KE. Most competing programs (Super 3D, Swivel 3D, Dimensions) demand



This cup was created with Origins. Although the program can produce shading, it can only render a single light source, from the viewer's perspective. Unlike other 3-D programs, Origins doesn't let you punch holes through solid objects.

considerably more memory. The color version of Origins was delightfully fast on a Mac II and IIcx, especially in generating renderings. The code is "32-bit clean," and a revision that runs on the Mac IIci is already shipping.

Origins is an excellent value, combining both 2-D drafting and 3-D rendering in a single package for \$600. Deltasoft has packed a lot of good ideas into the program, but the interface and documentation still need a substantial amount of work. Origins clearly shows promise, but you would do better to wait for the next version. With a little work, Origins could become an excellent program instead of just a fair one.

- Mike Markowitz

Get Info

Origins \$\$\$

List Price: Monochrome, \$495; color, \$595.

Published by: Deltasoft, P.O. Box 55089, Tulsa, OK 74155-5089; (918) 250-5594.

Version: 1.0.

Requires: System 6.0 or later and two 800K disk drives; harddisk drive and math coprocessor recommended.

Application Size: 517K. Compatibility: Mac 512KE. (monochrome); Mac II (color) or later.

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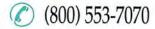
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REO-650

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Up to Date

Changes New and Noted

CANVAS 2.0.

from Deneba, is now in version 2.1. The new features include six dashed-line styles plus customizable dashed lines; a 100,000-word spelling checker that's compatible with Deneba's Spelling Coach Professional; Canvas Separator, a utility for creating CMYK (cyan, magenta, yellow, black) four-color separations of Canvas illustrations that can be sent directly to Post-Script-compatible typesetters; and EPSF and MacDraw II formats. Improvements have been made to the Bezier-curve implementation and the alignment manager. \$299.95; upgrade, \$30 if purchased before August 1, 1989; free if purchased after August 1, 1989. Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122; (305) 594-6965.

PANORAMA,

ProVUE Development's unique flat-file database, has been upgraded to version 1.5. Enhancements include variable-height reports, display of multiple images within its FlashArt graphics library, formula searches, and a homonym mode for making "sounds like" matches during a search. \$395; upgrade, \$29.95 for registered owners. ProVUE Development, 15180 Transistor Lane, Huntington Beach, CA 92649; (714) 892-8199.

WORDPERFECT

is now in version 1.0.3. Its principal goal in the upgrade was greater compatibility with the PC version of WordPerfect. Version 1.0.3 can read and write files in PC version 5.0 format. The company has just released PC WordPerfect version 5.1, which Mac version 1.0.3 can read only as version 5.0, so PC users will have to save their documents in that format. \$395; upgrade, \$10 shipping and handling for registered owners; free if obtained from dealer. WordPerfect, 1555 N. Technology Way, Orem UT 84057; (801) 225-5000.

DATADESK,

Odesta's statistics and data-analysis program, has had its first major upgrade, to version 3.0. Its improvements include 64-color dynamic graphics, including sliders for setting parameters; Post-it notes; and a graphical interface for designing and working with GLMs (general linear models). \$595; upgrade, \$125 for registered owners. Odesta, 4084 Commercial Ave., Northbrook, IL 60062; (312) 498-5615.

COMMUNICATIONS

America Online and Prodigy

America Online may be the on-line service of the future, but Prodigy is a crude IBM port.

Two new national services have recently released Macintosh software, but all they have in common is that they're new to the Mac.

America Online

The first and better of the two offerings is America Online, which started out as AppleLink Personal Edition. When Apple withdrew its blessing from the project, the developer — Quantum, best known for its Commodore products — took over entirely.

The software makes good use of the Mac interface — including 8-bit color in the opening screens. Navigation is easy, and there's a good variety of Mac-related information and programs to download. From what has been said and shown to date, America Online should be a force to reckon with in the electronic world fairly soon.

Messages are not threaded by topic, and it can be difficult to follow related chains or read lots of messages. This will become an increasingly serious drawback as time passes. Quantum says it will have threading by early 1990, but past experience with other on-line services suggests that providing it may not be an easy task.

Performance varied during our tests. Sometimes 2,400 bps came through as 2,400 bps and sometimes it seemed like 300 bps. The time of day didn't seem to matter; performance often varied widely during a single session. Quantum is aware of this problem, and has sent an on-line letter to all Mac subscribers that says it will be adding more computing power to eliminate the performance peaks and valleys. Right now performance rates a decidedly mixed review.

America Online costs \$5.95 per month (although one free hour of off-peak service is included) and \$5 per off-peak hour (6 P.M. to 6 A.M.) or \$10 per peak hour of connect time. These are decent prices if you're actually getting full speed. It's not a good value at the lower speeds too frequently encountered during testing, however. Neither CompuServe (with its excellent MAUG area) nor GEnie needs to worry about America Online — yet.



America Online started out as AppleLink Personal Edition, before Apple backed out of the project. Its departments' icons show good use of 8-bit color, and a variety of information, services, and downloadable programs is available. Performance is uneven, but Quantum is working to solve these problems.

Prodigy

The other new on-line service is Proofigy, the result of a collaboration between Sears and IBM. The software is as crude as any you'll see running on a Mac — and that's a Mac without MultiFinder (or even DAs), because Prodigy can't handle either. There's no use of standard Mac fonts (everything is bit-mapped graphics), and the colors are bright but simple — similar to those in MS-DOS games.

The screen display is slow, but your modem has to work frantically to reveal the little bit the screen actually contains. That means that there's virtually no hope

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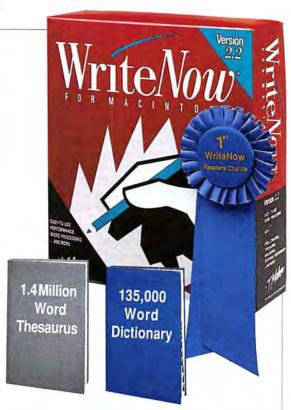
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Start Up



Prodigy is the Mac version of the IBM/Sears on-line service. It's cheap, but it looks and behaves like a PC product. Its on-line shopping and information services may be valuable for some users, but it's slow, and you won't be able to use MultiFinder or any of your DAs.

of a speed improvement without a total software redesign — an unlikely occurrence, given the developers. So far, I've terminated every Prodigy session before I was done through sheer frustration at the sluggish speed. And that was using a 2,400-bps modem. You shouldn't even consider Prodigy if you have only a 1,200-bps modem.

The best thing about Prodigy is that it's cheap. You need to buy the software, but it often comes with enough free service to make it essentially free, and thereafter it costs \$9.95 a month for all the time you, and up to five members of your household, spend connected. The reason the cost is so low is that the bottom quarter of the screen is devoted to horizontally

scrolling ads. At any time, you can see more details about the advertised items and even buy them.

That's what Prodigy really is good at: on-line shopping. A wide variety of goods and services is available, and finding items, information, and prices is far easier than getting other kinds of data.

As for more traditional on-line items, the offerings are more limited. There is a Mac bulletin board with threaded messages, but reading them is tedious because the screen shows very little information (about 12 lines per screen) and new screens take too long to appear. There are no downloadable files, nor does there appear to be any mechanism for providing them. Simply finding the Mac bulletin board is not straightforward. The fairly extensive documents are aimed at noncomputer users and casual shoppers,

Logging on is a pain. There's no automated log-on, and you must remember not only your password but also your ID number. This is 1983 technology. Navigation is difficult — no menus, DAs, or cut-and-paste function — and there are four selection techniques, one of which you must find for each instance (because only one or two of the techniques work in any given place).

Performance, as noted, is abysmal. If you use the shopping features or play the on-line games, you'll get some value for your money. But if you want to see what the Mac can do on-line, try any of the other services and avoid Prodigy.

- Steven Bobker

Get Info

America Online \$\$\$1/2

List Price: Starter kits, free; basic charge, \$5.95 per month (includes one off-peak hour). Additional on-line charges: \$5 per hour (off-peak); \$10 per peak hour.

Published by: America Online, 8619 Westwood Center Drive, Vienna, VA 22182; (800) 227-6364.

Version: 1.0.

Requires: Any Mac with at least 1 megabyte of RAM and Hayes-

compatible modem.

Application Size: 222K.

Compatibility: Mac Plus or later.

Prodigy 👯

List Price: \$49.95 (includes software and first three months' service); \$219.95 (includes software, 2,400-bps Hayes modem, and first three months' service); flat rate, \$9.95 per month.

Published by: Prodigy, 445 Hamilton Ave., White Plains, NY 10601; (800) 822-6922, ext. 205.

Version: 1.0.

Requires: Hayes-compatible modem, System 5.0 or later. Application Size: 109K. Compatibility: Mac Plus or later. Not MultiFinder compatible. LANGUAGES

THINK C

Symantec's upgraded C compiler is the objectoriented C of choice.

Apple has stated that object-oriented programming (OOP) is the methodology of the future. One of the most popular development environments today, Symantec's THINK C, has just had a major upgrade to version 4.0. This revision endows THINK C with objects.

Object-oriented programming has been around since the days of the Lisa: Clascal was a precursor to today's Object Pascal, which was used to write Apple's MacApp class library. But today a large proportion of programmers prefer C to Pascal, and a large number of these C programmers use THINK C.

WHAT IT IS THINK C 4.0 implements Object-C, an extension to standard C that provides the same degree of functionality that the Object Pascal extensions do to standard Pascal. These relatively minimal extensions are sufficient for most object-oriented applications. Object-C is not C++, the object-oriented language developed at AT&T that's based on C and is much more complex and feature-laden. Object-C can be considered a subset of C++ and should be compilable by a C++ compiler without much alteration.

Object-C itself is a good starting point for developers interested in objectoriented-software development on the Mac. But Symantec didn't leave it at that. Included in THINK C 4.0's package is a complete object-oriented-application framework called the THINK Class Library (TCL).

The TCL is written entirely in Object-C and is supplied in source form. It's nowhere near as large and intricate as Apple's own MacApp, but for beginners, this is a distinct benefit. Because it is provided in source form, you can explore the TCL and get to understand it much better than by only poring through the documentation. The TCL provides the necessary code to construct a complete Mac application, relieving you of reinventing the wheel for each new application you write; all you do is add the



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specific functionality of your application. You can let the TCL provide the elements of your application's user interface, printing, and most of the other mundane parts of a Mac program.

A further object-oriented programming aid, apart from the TCL, is the framework provided for writing cdevs (Control Panel devices). Until now, the cdev-programming interface has been somewhat complex, but the cdev "template" that comes with THINK C 4.0 makes cdev development about as easy as it will ever get.

THINK C 4.0 also has nonobjectoriented enhancements. The syntax of the language has been updated to reflect standard ANSI C. THINK C 4.0's ANSI compatibility is reflected most prominently by the completely rewritten libraries and by the ANSI-style function declarations that are now permitted.

The in-line assembler has long been a favorite feature of THINK C programmers. THINK C 4.0 now accepts 68020 and 68881 instructions but not instructions specific to the 68030 and 68851 chips. Nonetheless, THINK C 4.0's code will run on Macintoshes that have these processors.

Another significant feature addition is the ability to develop multisegment code resources with THINK C 4.0; this was not possible with any previous version.

Finally, there are numerous small-detail enhancements in THINK C 4.0's environment that reflect reactions from users of earlier versions. For example, until version 4.0, the THINK C editor was the bane of many programmers' existence, because it wouldn't backspace over the beginning of a line — the 4.0 editor will.

Get Info

THINK C 4.0 \$\$\$\$1/2

List Price: \$249.

Published by: Symantec, 10201 Torre Ave., Cupertino, CA 95014; (408) 253-9600.

Version: 4.0.

Requires: System 6.0 or later; MultiFinder, 2 megabytes, and hard-disk drive strongly recommended.

Application Size: 263K;

Debugger, 61K.

Compatibility: Mac Plus or later.

The THINK C 4.0 documentation comes in two softbound volumes: The smaller book is the standard library reference for the ANSI libraries, and the larger tome is the user's manual. Within the latter's more than 500 pages, the environment's components are introduced; roughly half of the manual is dedicated to a description of the TCL and Object-C.

HOW IT WORKS While THINK C 4.0 is one of the best C development packages around, there are still a few blemishes. The documentation does not provide a walk-through of how to build an application with the TCL (although Thom Hogan and Kurt Matthies* new monthly Power Programming column can help with that).

Looking at the many examples that are provided is generally sufficient for experienced programmers, but a novice will be daunted by the TCL without some step-by-step instruction. The otherwise helpful source-level debugger in the environment still can't save the contents of its data window; for programmers who are iterative in their edit-compile-debug cycle, the lack of this feature is extremely frustrating. Finally, there is no class browser. Although this is not necessarily a glaring omission, a class browser makes object-oriented development much easier by letting programmers look at their object-hierarchies graphically.

THINK C 4.0 is a fine product that's more than worth its list price of \$249 (and a steal at \$69 for the upgrade from *any* earlier version of the product). Even though Object-C is not C++ and the TCL is not compatible with MacApp, THINK C 4.0 is a powerful object-oriented development tool.

- Stephan Somogyi

Rumor Manager

Gossip, Guesses, and Goings-On

The flowers are starting to bloom in some parts of the country, the ground-hog has made her predictions about how long winter is going to last, and Apple has come up with a whole new set of code names. Some that have already leaked are Sahara, Gobi, and Mojave for CPUs; The Hulk, Spider-Man, and Sluggo for add-in boards such as the graphics and sound accelerators; Joyce for a new cursor-control device; and Disneyland, Monopoly, and Clue for hard-disk drives.

The news from Microsoft, where the code names are more or less fewer and saner and the applications larger, is exciting. Aside from the usual round of "semicompatible" upgrades (Word 5.0, Excel 3.4, etc.), three entirely new Macintosh products are under development.

The first is a killer of a low-level word processor that will replace the unfortunate and not particularly lamented Write. It's modestly code-named Shakespeare, and you should have seen it around Christmastime. (What? You didn't??)

The folks at Microsoft wistfully recall the success of the DOS version of Flight Simulator and don't see why they

can't have equal success in the Macintosh game market. All that we've been able to find out is that the code name is Super Bowl, it is not a football or even a sports game, it's most definitely not another flight simulator, its target price is \$59.95, and it must ship (so say the memos) by the Boston Expo in August.

Then there's the much discussed relational database. Given the overall weakness of such beasts in the Mac arena, why Microsoft is proceeding with this project is beyond the Rumor Manager. Given our druthers, we'd call it Turkey, but the good people in Redmond and Sunnyvale (where the graphics portion is being developed) variously call it Galaxy and Time Machine. The final product needs a 68020 or better Mac and is a full-color knockout.

Our U.S. Mail address is Rumor Manager, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Our electronic addresses are MacUser (on MCI Mail), 70411,204 (on Compu-Serve), and MacUser.Edit (on AppleLink). No calls, please.

The 5th Annual Editors' Choice Awards

MacWAREHOUSE congratulates all 123 nominees for MacUser's 1990 Editors' Choice Awards. The winners are announced on page 92 of this issue. But, if you would like to get your hands on the products themselves — at these great, low prices — call our toll-free number right now.

You can order anytime up to 12:00 midnight and we'll rush the order to you overnight — for only \$3. Nobody beats our fast, dependable, overnight service and free technical support. (Certain nominees' products are not available for sale by mail order and are not listed.)

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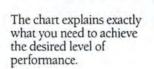
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4 MB	Replace all four 256K SIMMs with four 1M SIMMs.
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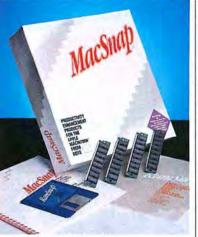
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ImageWriter or LaserWriter1	2.
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Mac SE & extd. or reg. keyboard 1	1.
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Mac II and extd. keyboard12.
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MacInker (IW & IW II)41.
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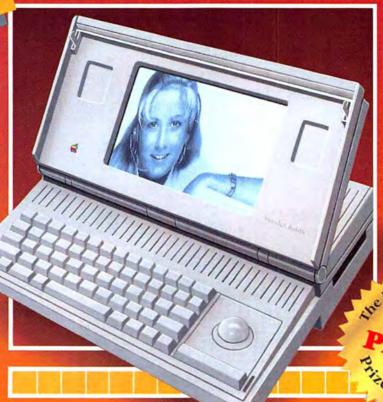
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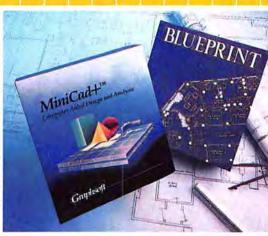
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mats (Super 3D, MiniCAD+, DXF, IGES), and 2D formats (PICT, EPS). Strat-aVISION 3d takes full advantage of the 32 bit Color QuickDraw. It prints Post-Script printers, film recorders, and video recorders. (graphics) \$375.

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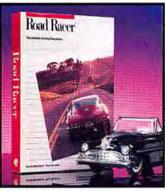
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RoadRacer (X.O.R. Corp.)

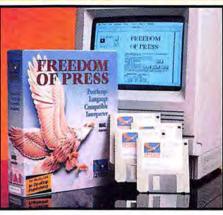
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DOS Mounter

DOS Mounter is a utility that lets the Apple FDHD SuperDrive in the new Macintosh computers access MS-DOS disks from the desktop, instead of through Apple File Exchange. With DOS Mounter in the system folder, MS-DOS disks appear on the desktop and behave just like Macintosh disks. (utilities) \$55.

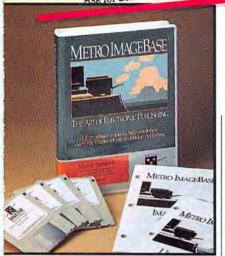


Virex 2.1

Virus detection and treatment software. Intended for indisoftware. Intended for indi-viduals who have unusually high risk of exposure to viral infections, including Fortune 500 companies, and desktop publishing firms. Useful for those who use public domain software or networks. (security) \$55.



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Omnis 5 (Blyth)	

Omnis 5 utilizes the graphical interface, enhanced memory, storage and color ca-pabilities for both the Macintosh and IBM PS/2 hardware. It is designed to produce PS/Z hardware. It is designed to produce data files that can be shared between the Macintosh and IBM PC. Multi-user capabilities gives simultaneous data access from both platforms. CL/1 and SQL connectivity allows Omnis 5 to access data from the VAX or IBM mainframe. HyperCard access is fully supported by Omnis 5. Included is Omnis 5 Express which allows the beginner to outline require.





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Mac-101 Keyboards (DataDesk International)
Features 101 keys including a numeric keypad, a separate T-shaped cursor keypad, Cancel Key, Option and Command keys at both ends, definable function keys, plus scrolling, page control, and zooming keys. Manufacturer's two year warranty. (input/output) \$139. International Versions also



DaynaFILE

An external SCSI disk drive, DaynaFILE allows Macintosh computers to read and write MS-DOS data disks as easily as if they were Macintosh disks. Available as a single-drive or dual-drive unit, DaynaFILE can accept 5.25" or 3.5" MS-DOS disks in any format. (drive) Single drive \$525. Dual drive



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White Knight 11.0 (FreeSoft)
White Knight is Scott Watson's successor to the legendary Red Ryder telecommunications program. It's more than just a new version - the added new features list alone is more than 20 pages long! The 270+ pg. manual has plenty of step by step tips to help beginners communicate like the pro's in no time. White Knight comes bundled with Okyto, a revolutionary Mac-to-Mac file transfer program. A free subscription to the GEnie network is also provided. (communications) \$89.

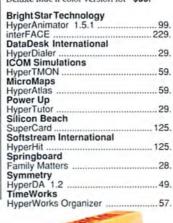
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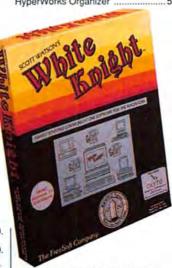
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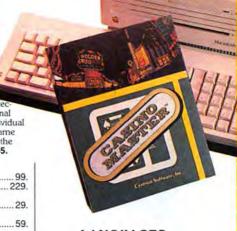
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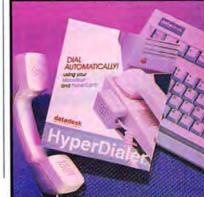
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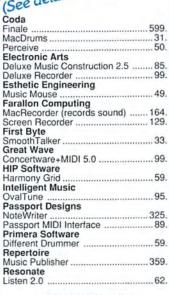
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ated another utility that you cannot live without. (5 mice MacUser award) Shortcut appears in every application's OPEN and SAVE dialog with a menu full of file/folder maintenance commands. A find command will locate lost files, instantly access fre-quently used files and fold-ers; create new folders, rename or delete files/folders, UnStuff (decompress) Stufflt archives, and much more! (networking) \$49.



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Dreams

(Innovative Data Design)
IDD, creators of MacDraft, offers a powerful precision drawing tool for professional scaled drawings, illustrations, presenta-tions and general purpose graphics. Dreams offers zoom, rotation, layers, dimensioning, symbol libraries and a vast array of drawing tools, as well as many advanced illustration features. You can merge shapes together, cut edges of objects using other objects as templates...even glue lines and curves together to form unique shapes to be filled with colors or patterns. (graphics) \$325.



(Kennect Technoloy)

currently being 'bundled" at no charge with Drive 2.4. (drives) \$339.

Now you can upgrade all of your older Macs to Apple's new standard of 1.44 meg, read MS-DOS, expand diskette capacity to 2.4 meg, and backup an average of 4 meg per disk, at a reasonable cost. Mac 512e, Plus, SE and II (with cable) simply plug Repport into the disk drive port, which allows you to read 720K MS-DOS on your internal disk drive, or read/write MS-DOS on your external Apple 800K drive. (drives) \$209.

Drive 2.4 Drive 2.4 is an option for Rapport which reads, writes, and initializes all current IBM & Mac 3.5" standards, plus optional formats of 1.2 meg on standard disks, and 2.4 meg on high density media. Fastback II is

O I I I I I O I I C I I I I I I I I I I	0.0
Abacus Concepts	
StatView II	
StatView SE+Graphics	. 199.
BrainPower	
StatView 512+ (requires 512k)	.149.
D2 Software	
MacSpin 2.0	180
Odesta	. 103.
	000
Data Desk Professional	. 289.
Paracomp	
Milo	. 159.
Select Micro Systems, Inc.	
Exstatix	219
Wolfram Research	
Mathematica (SE)	AFO
wathernatica (SE)	. 450.

UTILITIES

Abbott Systems	
CanOpener	65
Affinity	
Tempo II	70
Aladdin Systems Inc.	/ 3.
Programmer's Assistants	75
Programmer's Assistants	/5.
Shortcut	49.
ALSoft	
DiskExpress II	Call.
Font/DA Juggler	42.
MultiDisk	49.
Master Juggler	64.
Berkeley System Design, Inc.	
Stepping Out II	50
OF C-Harris	
DiskTop 4.0	65
QuicKeys 1.2	64
Caere	04,
	EAD
OmniPage	549.
Central Point Software	
Copy II Mac (with MacTools)	24.
PC Tools Deluxe For Mac	45.
Custom Applications	
Freedom of Press 2.1a	265.
Dantz Development	





CompuServe

You can now contact MacWAREHOUSE or place orders with us in the Electronic Mall on CompuServe. The MacWAREHOUSE GO code GO MW. As always, you'll get fast, dependable overnight service and you can leave messages for Kerry or any of our support staff.



DiskFit 1.5 (SuperMac)

A handy utility for backing up your hard disk on a series of floppies. It saves time because it backs up only those files which have changed since the last backup. DiskFit can verify each floppy after copying files onto it, so you know that your files are safe. Diskfit also discards old versions of files so your backup set doesn't keep growing. Version 1.5 supports a variety of cartridge tape drives, including the Apple tape backup system. (utilities) \$58.

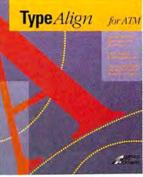
Dayna Communications
DOS Mounter55
Emerald City Software
Lasertalk 1.0149
Fifth Generation
FastBack II 107
FastBack II
Pyro15
Suitcase II
CO Technology
GO Technology MacTree Plus46
On Cue35
On Gue35
Insight Development
MacPrint95
Magic Software AutoSave II
AutoSave II29
BackMatic
Mainstay
Capture 2.049
Microlytics
GOfer45
011
ClipShare139
MultiClip50
On Technology
On Location75
GOfer (Microlytics)
The ultimate text finder. A powerful soft-

The ultimate text finder. A powerful software utility that searches, finds and retrieves text. Searches through countless files on your hard disk drive or floppy disks to find the text you need. A phrase, a fact, a note, a date. If you need it, Gofer finds it in seconds. You can automatically import the section of text into the document you're currently working in. You save hours searching through files. GOfer operates as a Macintosh desk accessory. (utilities) \$45.



Circle 38 on reader service card

PCPC	
HFS Backup 3.0	.54.
Peripheral Land, Inc.	
TurboBack	.55.
TurboCache or Turbo Spool ea.	69.
TurboOptimizer	39.
Preferred Publishers	
Exposure	54
Software Innovations	
HandOff	32
SuperMac	. 52.
DiskFit 1.5 or SuperSpool 5.0	50
Sentinel 2.2	07
SuperLaserSpool 2.0 (single user) .	.07.
Super LaserSpool (5-pack)	295.
Symantec Corporation	00
SUM II	.99.
Tactic Software	
FontShare 2.0	149.
Icon-It 2.0	. 39.
Williams & Macias	
DiskFinder	.27.
myDiskLabeler	.33.
StickyBusiness 1.07	.89.
XTree Company	
XTree Mac	.52.
	_



TypeAlign (Emerald City Software)
Exclusively for ATM owners: give your type a change of face with TypeAlign. Rotate, wrap, skew and kern type, then add special effects like outlines and see it all on screen, instantly. Print on any ATM-supported printer including ImageWriters, DeskWriters and LaserWriters. Works with major word processing, desktop publishing and presentation programs and Adobe PostScript fonts. Also supports over 16 million colors. (fonts) \$63.

WORD PROCESSORS & OUTLINERS

0 0 4 1 2 11 12 1	
DeltaPoint, Inc.	1.2
MindWrite 2.1 Ashton-Tate	
FullWrite Professional	259.
Claris MacWrite II	179.
Microsoft	
Word 4.0 New Horizons Software	
WordMaker Niles & Associates	65.
End Note	75.
Symmetry Acta Advantage w/DA	65.
T/Maker WriteNow 2.0	
MardDarfact Corn	
WordPerfect WordPerfect Working Software	229.
Working Software QuickLetter	73.

CONTEST RULES 1. Entries must be received on or before 4/30/90, 2. Winners selected in random drawings by attorneys for MicroWarehouse Inc. (MWH), whose decisions are final. 3. Mac Portable Computer prze subject to availability. MWH reserves the right to substitute wholesale cash value up to \$6,000, 4. Winners responsible for taxes. 5. Odds of winning depend on number of entries. All prizes will be awarded. 6. MWH will announce the winners on or around \$5/31/90. Winners notified by mail. Dates subject to change at the discretion of MWH. It unable to contact any winner, an alternate will be selected by random drawing. 7. Contest is open to US residents, except where prohibited by law. Employees of MWH and suppliers not eligible. 8. Prizes - one Mac Portable Computer w/40MB hard disk and 150 software and media prizes.



Two Page Monochrome Monitor (Cutting Edge)
Every Mac SE and II user can now justify the expense of a big screen with the new Cutting Edge 19.
Two Page Monochrome Display System. The Cutting Edge Monitor Includes the interface card and matches just about all the features of other big screen display systems costing twice as much. It has a flicker-free refresh rate of 70 hz and a high resolution of 72 DPI. Like all Cutting Edge products it comes with a one year warranty and a 30 day money back guarantee. (hardware) \$999.



I'm Donna, call me at



E-D-I-T-O-R-S' C-H-O-I-C-E



he year 1989 saw the introduction and maturation of some exciting products and technologies. The appearance of the Macintosh Portable, along with a new line of faster Macs, would be exciting enough in a duller year to raise anyone's heart rate, but we also saw the announcement of System 7, the rollout of revolutionary products such as Adobe Type Manager (ATM) and Freedom of Press, intelligent interfaces and voice recognition, sophisticated calibration techniques, 32-bit QuickDraw, higher standards for DTP, continuous-tone thermal printing - and the list goes on and on. With all these introductions and changes, how do you decide which products are the very best?

Every year, the entire editorial staff of MacUser goes through a grueling but exciting process: We survey the expanding Macintosh universe (no mean feat), come up with a long list of nominees in 40 categories, hold them up against a year's worth of lab tests, and vote for the top products of the year. The result is the select group of products that are known as Eddy Award winners.

We also honor the best new technology of the year, the most-significant hardware and software products (trendsetters that set the stage for the future), and the best overall hardware and software products of the year.

The Eddies help you assess the Mac universe, but you don't get great products without great people. This is why we're introducing two new categories this year, the John J. Anderson Distinguished Achievement Award and the Derek Van Alstyne Rising Star Award, named in honor of the two MacUser editors who died tragically during the California earthquake of October 17, 1989. With these awards, we honor the human face in the interface, which is, after all, the prime engine that moves the Macintosh world.

BY THE EDITORS OF MACUSER

A-W-A-R-D-S



BEST DATABASE 4th Dimension

This year's Eddy goes to ACIUS' 4th Dimension 2.0, for its increased power and performance. ACIUS revised 4D's manuals from stem to stem and made marked advances in 4D's speed. These improvements, coupled with automatic button scripting, multipage layouts, superior relational strategies, streamlined data management, and easier-to-use procedures, make 4D 2.0 the most powerful database on the Mac.

HONORABLE MENTIONS

Honorable mention goes to Omnis 5 from Blythe, for its extensive growth in interface design and graphics support and its ease of porting to MS-DOS platforms. An honorable mention also goes to Double Helix II 3.0 from Odesta, for power improvements to an old user-friendly favorite.

BEST SPREADSHEET Wingz

Wingz 1.1 from Informix advanced the spreadsheet environment with 3-D graphics and graphic tools; a full scripting language that's powerful enough to modify the interface of the program; a wide selection of control devices such as buttons, sliders, and pop-up menus; and comprehensive number crunching that ranges from hyperbolics to matrix mathematics. Wingz is not just a powerful spreadsheet, it's a sophisticated development environment for customized applications.

HONORABLE MENTIONS

Ashton-Tate's Full Impact 1.1 is a frontrunner in the spreadsheet arena, with its scripting language and virtual memory. And Microsoft improved upon its best-selling spreadsheet in Excel 2.2 by enhancing its interface, which adds interapplication communication with its sister product Microsoft Mail.

PROCESSOR Microsoft Word

Microsoft listened to its users before producing Word 4.0. Not only did it eliminate nearly every problem of the infamous Word 3.0, but it also added some genuinely innovative features, such as an integrated table maker, completely customizable menus, and dynamic data links, while vastly improving the interface. Word 4.0 is an exceptionally powerful word processor, with an amazing array of features, but without the speed and memory penalties you might expect.

HONORABLE MENTIONS

MacWrite II 1.1 from Claris packs a terrific interface and an impressive set of features — including an open architecture that supports extensive file translation. Nisus 2.03 is Word's fast high-end competitor from Paragon Concepts, with superb editing features, unlimited

Undos, a powerful search capability, macros, and an integrated, object-oriented graphics environment.

BEST ACCOUNTING PACKAGE atOnce!

atOnce! 1.01 is the superb integrated general-ledger, accounts-receivable, accounts-payable, and payroll system for small businesses from Layered, the publisher of Insight. Its automatic posting routines are the secret to its integration—an entry in one module ripples through the others. Its password security; lists of accounts, customers, and bills; custom report writer; and flexible payroll system—coupled with an excellent interface—set the pace for small-business accounting.

HONORABLE MENTIONS

Arguably the best business deal on the Mac, M.Y.O.B. 1.0.2 from Teleware offers an integrated accounting system that's ideal for companies computerizing their books, with step-bystep on-line setup instructions, at an incredibly low price. Computerized Classic Bookkeeping 2.2 from Absolute Solutions is the first spreadsheet-based accounting system for the Mac that really works, bringing all the number-crunching power of Excel with only a few of its limitations.

BEST PERSONAL-FINANCE PACKAGE MacInTax

MacInTax from SoftView is the most popular tax package for the Macintosh, and with good reason. It not only offers high-quality onscreen representations of IRS forms, but also numerous worksheets and tools, such as a convertor for last year's MacInTax federal forms and an itemization tool that automatically sums individual items and provides a printable list for justifying deductions. SoftView offers an electronic filing service for fax and disk submissions, and in late '90, you'll be able to file by modem.

HONORABLE MENTIONS

Quicken 1.5 from Intuit is an improved version of last year's Eddy winner, the best one-write, check-ledger-based accounting system for the Mac and a great companion for MacIn-Tax, providing detailed linking reports for tax deductions and sources of income for various IRS schedules. CheckWriter II 2.0.5 from Aatrix places your checkbook at the center of your financial universe, giving you automatic recurring payments, check reminders, and a powerful search feature for locating related transactions.

BEST COMMUNICATION PRODUCT InterFax 24/96

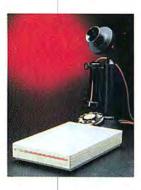
Abaton's InterFax 24/96 is as versatile and useful a modem as you can find anywhere: It







E-D-I-T-O-R-S' C-H-O-I-C-E



incorporates a 2.400-bps data modem with Level 5 MNP and a 9,600-bps Group 3 fax modem. Its fax software is easy to use and produces excellent output (especially when used with Adobe's ATM); it can also send and receive in the background, even without MultiFinder. And whenever you're not telecommunicating with the InterFax's data port, the InterFax 24/96 is ready to send or receive a fax.

HONORABLE MENTIONS

We were impressed with the marketing savvy of Farallon for its Portable Pac, a useful collection of network connectors, wires, and software for the road, but it was edged out by two other maturing products. Microphone II 3.0 incorporates support for the highly efficient ZMODEM protocol and lets you create a complete custom front end, replete with color icons, dialogs, and access to HyperCard XCMDs. Microsoft Mail 2.0 is a straightforward E-mail package meant for use at large sites, with automatically propagating directories and interapplication communication with Word and Excel.

BEST PAGE-DESIGN PROGRAM QuarkXPress

Electronic publishing has taken an obvious turn toward the high end, incorporating essential features such as color separation and comprehensive design tools. QuarkXPress 2.12 leads the way with prepress links, on-screen type scaling, process-color separations, and easy expandability via its XTensions add-on modules. These features, combined with its sophisticated graphic and typographic tools, make it a winning package.

HONORABLE MENTIONS

Letraset's high-end **DesignStudio** offers 24bit color and a rich set of graphic and typographic controls, plus such niceties as a pasteboard metaphor, object grouping and rotation, editable thumbnails, and add-on modules. Timeworks' low-end **Publish It!** is an inexpensive, well-rounded package for users who've been left behind by the giants.

BEST PRESENTATION PRODUCT DeltaGraph

When a small company produces a product that's not only the best in its class but a terrific value as well, it deserves recognition. DeltaPoint's DeltaGraph 1.0 is currently the best Mac charting and graphing application. It's powerful, flexible, and a bargain. DeltaGraph combines 2-D and 3-D color charting with object-oriented graphics and maintains compatibility with spreadsheets such as Excel and Trapeze and true graphics applications such as Illustrator 88.

HONORABLE MENTIONS

Aldus Persuasion 2.0 now leads the field in conventional slide-making presentation tools,





he John J. Anderson Distinguished Achievement Award recognizes more than mere technical excellence. John was a champion of good user-interface design, of using computers to enhance human creativity, and of pushing the envelope.

John recognized immediately that the original Mac embodied these virtues. Hence, it is the spirit and enduring achievement of the original Mac team — a group of nearly 40 individuals — that we recog-

nize this year. It was their vision of the Macintosh, introduced in January 1984, that really changed forever the way we think about computers. Over the next six years, the promises of the little Mac were realized, one by one, until we reached the Mac of today, vastly more capable and yet undeniably the same machine.

Some of the members of that original team have remained in the limelight. Bill Atkinson invented HyperCard. Andy

Hertzfeld continued to look out for the Mac user even after leaving Apple. And Chris Espinosa is familiar to longtime readers of this magazine. These are just three members of an extraordinary team.



A-W-A-R-D-S



with a full-featured outliner and auto-templates for faster slide design. And MacroMind Director 1.0.1 has almost single-handedly made Mac animation a pervasive element in presentations.

BEST TYPOGRAPHIC PRODUCT TypeAlign

Sophisticated typography is finally coming of age on the Mac, thanks in part to ATM and its first top-notch add-on product, TypeAlign 1.0, by Emerald City. This simple, elegant DA lets you type text directly onto lines, arcs, and free-form curves. The text can be kerned, colored, rotated, or distorted and then pasted directly into an application or saved as PICT or EPSF files. If you have ATM and want to do typographic special effects, TypeAlign is a must.

HONORABLE MENTIONS

Adobe Type Manager is the first product to provide WYSIWYG display of Adobe Post-Script fonts, and it also improves the appearance of large type sizes on non-PostScript printers. Broderbund's TypeStyler 1.0 lets you create sophisticated special effects with thousands of third-party PostScript fonts.

BEST OCR PRODUCT OmniPage

Caere's OmniPage was the first automatic OCR package for the Mac and one of the easiest to use. It was also the first with page-recognition capabilities that enabled it to recognize page-layout formats and text styles. Version 2.0 added landscape-oriented scanning and recognition; ten European character sets; more file formats for saving; better format retention for tabs, indentation, justification, and bold and italic text; and more scanner support.

HONORABLE MENTIONS

Accutext 1.0 from Xerox Imaging Systems is the chief challenger to OmniPage in the world of automatic OCR, with its sophisticated context intelligence and scanner and recognition controls. In the sphere of trainable packages, ReadStar II Plus 1.06 from Innovatic leads the way for its speed and accuracy, followed by TextPert 3.01 from CTA for its support of many languages and alphabets.

PROGRAM Canyas

Of the fine programs that were introduced or matured in '89, Canvas 2.1 from Deneba stands out. It has evolved into a multipurpose drawing and painting application with 24-bit color, unlimited layers, Bezier curves, precision tools, bit-mapped editing at high resolutions, a spelling checker, and full color separation. A bundled DA version adds considerably to its value.

HONORABLE MENTIONS

PixelPaint Professional 1.0, from Super-

Mac, delivers virtually limitless colors, sophisticated effects, and a comfortable interface for creating, editing, and color-separating full-color images. Studio/1 1.0 from Electronic Arts is arguably the best black-and-white painting program for the Mac, and its tools are a joy to use. It's also a capable animation program.

BEST 3-D-GRAPHICS PROGRAM Swivel 3D

The Mac's graphics frontier has taken great strides into the third dimension. Swivel 3D 1.1 from Paracomp advances Macintosh 3-D modeling on several fronts: speed of drawing, an object-handling interface, realism, sophisticated animation, and mechanical linking of objects. Its exportation skills let you place 3-D



MOST SIGNIFICANT SOFTWARE PRODUCT

Adobe Type Manager
dobe Type Manager elegantly
moves us one step closer to the
WYSIWYG ideal. It works with
existing applications to provide
smooth screen display of Type-1 PostScript fonts in any size and greatly improves the printed quality of large type
on non-PostScript printers. It's a significant aid for professionals and
amateurs alike.

HONORABLE MENTIONS

Freedom of Press, from Custom Applications International, is software that brings PostScript-printing capability to non-PostScript output devices, from inexpensive ink-jet printers to high-quality film recorders. And Vellum from Ashlar redefines the aided in computer-aided design, pointing in a new direction for intelligent interfaces.





Type Allon



E-D-I-T-O-R-S' C-H-O-I-C-E

renderings into still and animated presentations.

HONORABLE MENTIONS

Strata Vision 3D 1.0 from Strata combines a friendly interface with mainframe-grade photo-realistic 3-D rendering. Its effects include ray tracing, refraction, shadows, smoothing, and anti-aliasing. Super 3D 2.0 from Silicon Beach has a very Mac-like interface, powerful cloning and shaping abilities, and animation. It's an excellent general-purpose 3-D tool.

BEST ANIMATION PROGRAM

MacroMind Director

MacroMind Director is a large, complex, powerful program that's easily the best graphics-animation package for the Mac. If you can draw it, digitize it, or electronically sculpt it, Director can import, combine, animate, synchronize, and title it and play back the finished product. It's the key software for multimedia productions on the Mac.

HONORABLE MENTIONS

Studio/1 from Electronic Arts combines an excellent black-and-white painting program with frame-by-frame animation, sound, and sophisticated motion effects, even into the third dimension. SuperCard, Silicon Beach's hyperauthoring software can create and script-

animate its objects, record motion, play PICS files, and synchronize the action with sound.

BEST CAD PACKAGE Vellum

In the expanding universe of Macintosh CAD (there are currently almost 50 products), it's tough to weigh feature against feature and come up with a winner. Ashlar's Vellum, a 2-D (and soon-to-be 3-D) CAD package, wins this year's Eddy not so much as a feature powerhouse but because of its breakthrough intelligent interface. Vellum's drawing assistant anticipates likely acts in the process of drawing, helping you sketch out your draft. Coupled with Vellum's integrated parametrics, it's a first for Macintosh CAD.

HONORABLE MENTIONS

Claris CAD, the most popular package for the Mac, was a serious contender here, but it was edged out by two key products. Powerhouse MicroStation Mac from Intergraph is a multiuser CAD package that uses reference drawings (overlays) for work-group projects over a network, as well as a multiplatform file format. And In-CAD from Infinite Graphics is the first package to bring true 3-D solids modeling and stereo lithography to the Mac.



THE DEREK VAN ALSTYNE RISING STAR AWARD Raymond Lau

f the John J. Anderson Distinguished Achievement Award takes a long look backward to recognize enduring contributions, the Derek Van Alstyne Rising Star Award is an attempt to predict the future. Derek was a rising star — a brilliant, dedicated programmer with a vision of the bright future that personal computers can bring. This year's recipient, Raymond Lau, also embodies these characteristics.

Ray Lau is a programmer in the Derek Van Alstyne mold: tireless and brilliant, with vision and the courage to try his wings. Many Mac users have downloaded files from an information service such as CompuServe and encountered Ray Lau's brilliance. Ray is the sole author of Stufflt.

Stuffit, a data-compression program that can be used to speed data transmission over phone lines or to squeeze more data onto a floppy disk, would be an impressive program if it had been a commercial product developed by a team of professional developers with years of programming experience. It was, in fact, a shareware program written by a 15-year-old. With Stuffit, Ray did something that



many major software vendors have failed to do: He single-handedly established a standard data format for an application area. This fall, Ray's accomplishment began to pay off as Aladdin Systems started distributing a commercial version of Stufflt.

Raymond Lau; a rising star in the Macintosh firmament.



A.W.A.R.D.S





Retrospect 1.1 by Dantz Software can quickly store data on almost every backup medium. It also offers flexible, comprehensive options to make selecting a specific group of files easy. Although originally touted as software for archiving, it also makes backup chores as painless as possible.

HONORABLE MENTIONS

Fifth Generation Systems' Fastback II 2.0 can also back up to numerous different devices with unparalleled speed in backing up to floppy disks. Redux 1.6 from Microseeds Publishing is another superb backup program, with incremental backup to any Finder-mountable drive.

BEST INFORMATIONMANAGEMENT SOFTWARE KeyPlan

Project-management software is often a tradeoff between power and ease of use, and even midrange products can be daunting to use. **KeyPlan 1.0**, the graphically oriented product from Symmetry, is designed to change all that. It offers both CPM and Gantt project analysis but starts you out in its Acta-compatible outliner, a bow to the way people really begin planning.

HONORABLE MENTIONS

Kaetron's **TopDown 1.1a** is a flowcharting application with intelligent symbol connections and excellent document-navigation and reporting skills. **Focal Point II** from TenPoint0, the top HyperCard-based information organizer, integrates a Rolodex and calendar with time, project, and financial-management tools.

BEST CONNECTIVITY/ NETWORKING SOFTWARE MacLinkPlus/PC

MacLinkPlus/PC 4.0 has secured its place as the dominant file-translation program between different hardware platforms. It now includes more than 150 translators for programs in the Mac, DOS, NeXT, and Sun operating systems. It works from inside MacWrite II, TOPS, and DaynaFile, and transfers files over networks, modems, and serial links.

HONORABLE MENTIONS

Apple's CL/1 server for VAX/VMS is a landmark step toward automatic access to databases on host minicomputers and mainframes. Farallon's Timbuktu Remote 1.0.1 allows you to control another Mac and pass files to and from it through a modem connection.

BEST CONNECTIVITY/ NETWORKING HARDWARE DirectServe

The winner is Jasmine's DirectServe, an affordable AppleShare-compatible server drive that doesn't require a dedicated Mac. The list price of the DirectServe is \$800 less than that of

a Mac Plus with AppleShare server software. Just format as many SCSI hard disks as you need with the DirectServe, and you're up and running.

HONORABLE MENTIONS

Shiva's EtherGate is a versatile new AppleTalk router with two serial ports and an Ethernet connection that can be used as an Ethernet-to-LocalTalk router. Photonics' innovative PhotoLink provides wireless infrared LocalTalk connections.

BEST MATHYSTATISTICS PROGRAM Theorist

Theorist 1.01 from Prescience is an equation-solving and -graphing package that surpasses the highly rated Mathematica, last year's



Most Significant Hardware Product

Voice Navigator

hen we first saw a prerelease version of Articulate Systems' speech-recognition system, Voice Navigator, we expected it to be a crude and buggy experiment. We were amazed. Even then, it ran smoothly and effectively. As we watched it evolve, one thing became clear: Speech recogni-



tion is a vitally important computer technology. Voice Navigator's expansion of the inter-

beyond the keyboard, mouse, and screen is a major step toward computing with a human face.

HONORABLE MENTIONS

Color accuracy is a major concern in electronic publishing, and the Barco Calibrator monitor (also marketed by RasterOps as the Color-Board 724 Calibrator System) provides superior results. Honorable mention also goes to the Mitsubishi S340-10 dye thermal-transfer printer, the first to bring continuoustone color images to the Mac desktop.







for only \$99.

Now that Adobe Type Manager "is opening up a whole new world of type to every Macintosh' user, it's time to venture beyond the standard fonts—like New York, Venice and Geneva.

Introducing the Adobe Type Set™ font packages. Each sells for just \$99 and includes seven carefully chosen fonts worth hundreds of dollars if we sold them separately. So your dollar goes further than ever.

Adobe Type Set 1:

VAG Rounded Bold TRAJAN[®]
Freestyle Script Bodoni Poster
Hobo Lingtext* Cottonwood[®]

Adobe Type Set 2:

Franklin Gothic No. 2 Roman

Present Script Peignot Demi Juniper Cooper Black LITHOS BOLD

Cooper Black LITHOS BOL COPPERPLATE GOTHIC

But the really far-reaching news is what happens when you combine ATM" with the Adobe Type Sets. For starters, you'll get printed text that more closely matches your screen image—even from a low resolution, dot matrix printer like the ImageWriter! If you're an Apple LaserWriter or other Adobe PostScript' printer owner, you'll be amazed at how your screen type can be scaled to virtually any size, on the fly, and still look smooth and legible.

So if you've been tempted to explore the wonderful world of fonts, this is your chance to travel first class. With a select group from the Adobe' Type Library.





E DOIOTOOROS -H-O-I-C-E

Eddy winner, in interface and execution. Equations can be solved numerically or algebraically, or plotted as interactive 3-D graphs that can be animated, all without the user's having to learn any programming or syntaxes.

HONORABLE MENTIONS

Data Desk 3.0 from Odesta and JMP 1.0 from SAS Institute are excellent packages for advanced statistical analysis, featuring graphical interfaces that let you point at plotted data to get information or perform further analysis.



ANALYSIS PRODUCT SuperANOVA

Data comes in a variety of forms, and the three packages considered for this category are all very different. SuperANOVA 1.0 from Abacus Concepts edged out the others because

BEST DATA ACQUISITION/

of its broad-based appeal, presenting general

BEST NEW

TECHNOLOGY

32-Bit QuickDraw

year ago, when developers

were asked what they were

"We're waiting for Apple to

release its standard for 32-bit color."

The standard is now here and the

doing with color, they'd reply,

matix combines measurement, enhancement, and analysis in a complete scientific imageprocessing system.

linear modeling for the common man. A com-

plete drawing environment is included in addi-

Strawberry Tree's Analog Connection

Workbench 3.0 enables users to create a data-

acquisition, monitoring, and control environ-

ment in a few hours, using simple flowchart

icons. And if your data takes the form of X-rays

or micrographs, Image Analyst 7.1 from Auto-

tion to its long list of analysis features.

HONORABLE MENTIONS

BEST WORD PROCESSING UTILITY Acta Advantage

Word processors are becoming increasingly powerful, but they - and we - still need extra help. Acta Advantage 2.01 from Symmetry Software is an outliner and an organizer of text and graphics. It comes as both an application and a solid DA, giving you the freedom to jot down ideas, brainstorm, or flesh out a concept at any time. It's excellent for research, planning, and producing sorted lists and graphic catalogs.



GOfer 2.0 from Microlytics can quickly browse through the text in hundreds of pages in hundreds of documents. Thunder II from Electronic Arts is a well-designed interactive and batch spelling checker and glossary for programs and DAs.



peripherals and software that support this standard is growing daily.

variety of

HONORABLE MENTIONS

Continuous-tone thermal printing is the first printing technology to offer the promise of true high-resolution color printed output at a reasonable cost. ICI, Kodak, and Dai-Nippon have already produced technology that can print at near-photographic quality. Erasable optical technology burst onto the scene last year, putting the mass into mass storage with 1-gigabyte removable discs, with replacement cartridges costing less than 30 cents per megabyte, thanks to the original manufacturers of the optical assemblies, Sony, Ricoh, and Maxtor.

BEST GRAPHICS/PUBLISHING UTILITY

Freedom of Press

Graphics and publishing disciplines both rely on quality output. Freedom of Press 2.1a software, from Custom Applications International, makes sophisticated PostScript effects available on scores of non-PostScript printers and imaging devices. This puts page proofing and high-resolution final output within the capabilities of many excellent but previously incompatible peripherals.

HONORABLE MENTIONS

A crowded field of excellent utilities including DeskPaint and DeskDraw from Zedcor and Adobe Separator - made the decision difficult, but two products stood out as honorable mentions. Smart Art, from Emerald City, delivers a collection of graphic PostScript effects that can be customized and pasted into other documents. Snap Jot 2.0 from Wildflower Software places captured screen areas into floating windows for referencing, copying, or saving.

BEST FILE-MANAGEMENT UTILITY CanOpener

Until CanOpener, even so-called universal file openers required you to save a document in







A·W·A·R·D·S

files with corrupted proprietary formatting. It

can also display suppressed text in documents from word processors with multiple levels of

Complete Undelete 1.02 from 1stAid Soft-

ware can recover deliberately trashed files as

well as partially overwritten and previous ver-

sions of files that have been copied over. Disk-

Top 4.0 from CE Software is the best Finder

alternative around, now bundled with Micro-

BEST GENERAL UTILITY

Virtual

part of System 7 for 68030 and 68020 systems

(the latter with PMMUs), Virtual provides the

same functionality now. Version 2.0 provides 9 megabytes of address space plus an additional megabyte per free NuBus slot. SE/30 owners have six virtual slots, giving them a total of 15

megabytes, while IIcx owners have three virtual

Connectix' Virtual 2.0 wins in this category. Although Apple promises virtual memory as

lytics' GOfer, a text-search program.

HONORABLE MENTIONS

undo.



BEST ANTIVIRAL the file opener's unique format first, but thanks PROGRAM to Abbott Systems, that interim step is a thing of the past. CanOpener 1.1 not only opens any type SAM of paint, PICT, EPSF, or text file without con-The Eddy for the best antiviral software goes version, but it can also search for text strings even within a graphic - and recover data from

to Symantec Anti-Virus for Macintosh, or SAM 1.4. It was the first commercial product to introduce such a high degree of configurable protection from viruses and continues to be one of the best on the market. SAM comes with both an INIT shield and a hunter/killer application. Symantec's timely updates also prove that a large company doesn't have to be a slow one.

HONORABLE MENTIONS

Disinfectant 1.2, antiviral shareware written by John Norstad and a team of virus experts, is as functional and up-to-date as any of the commercial virus hunters, but it's free and updated frequently. Virex 2.0 distributed by HJC Software, contains both an INIT and a hunter/killer application.

PRODUCT

Sound is the too-often-forgotten factor in the





BEST MUSIC/SOUND **AudioMedia**

multimedia equation. The AudioMedia board



AUDIOMEDIA

slots in addition to the three you can actually put cards into. HONORABLE MENTIONS

Aladdin System's ShortCut 1.0.1, written by Raymond Lau, is an INIT/cdev that lets you find files (even within StuffIt archives), unstuff them, jump directly to folders, and select specific files directly, all from the keyboard. Boomerang 2.0B9 is a freeware INIT that remembers the last 15 to 30 folders and files you've accessed and presents them in a pop-up menu every time you select Open or Save from the File menu.

BEST PROGRAMMING TOOL Prograph

Prograph 1.2 from TGS Systems is a revolutionary new way of programming: Unlike text-based programming languages, Prograph's object-oriented language is totally pictorial. For many programmers, using Prograph will require a major mind shift, but for nonprogrammers, this is one of the first programming systems that does not require the comprehension of Byzantine command and character combinations.

HONORABLE MENTIONS

THINK C 4.0 is important because it introduced object-oriented programming into the well-known THINK C development environment. SmethersBarnes' Prototyper 2 deserves mention because it clearly shows the direction that CASE interface tools should be taking on the Mac.



reedom of Press from Custom **Applications International has** earned this Eddy by giving the full power of PostScript to a wide variety of output devices. This software brings high-quality imaging to more users than ever before. Makers of output peripherals can applaud this product for expanding their potential market into the Mac community.

HONORABLE MENTIONS

Adobe Type Manager's font-display and printing talents have raised the standards for what the Mac can do with type. MacroMind Director, with

its seasoned animation powers and farreaching importation of graphics and sound. has helped make the Mac a true multimedia machine.









Usually, the technology available to computer users just plods along—with competing products repeating one another's so-called improvements.

But once in a blue moon there's a great leap of innovation. Something new appears that's so well thought out, so smart, that the way you work may never be the same again.

WIZ[™] by CalComp, for example.

WIZ is an exciting new productivity tool. Combining the easy-to-use features of a mouse with the power of an "intelligent" graphics pad to enhance every pointing, tracing and drawing function you do.

WIZ meets the needs of virtually every Macintosh and PC user—from novice to advanced. Because WIZ gives you the convenience and flexibility of six programmable buttons, a cross-hair pointer and 1000 dpi for pinpoint accuracy, along with

Prehistoric.

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a user-definable mouse area.

What's more, WIZ unleashes the full power and speed of your software. Optional templates for most major programs eliminate tedious pull-down or bar menus. Because WIZ templates put the commands you use most at your fingertips for

instant access. And for the artist in you, WIZ offers an optional pen for drawing.

There's no rolling ball or moving parts. Nothing to clean. And WIZ has a five year warranty backed by CalComp, a world leader in computer graphics for over 30 years.

But the most amazing thing about WIZ is that you get it all for an introductory price under \$200.

See WIZ at your local dealer or call 800-CALCOMP.

WIZ by CalComp.

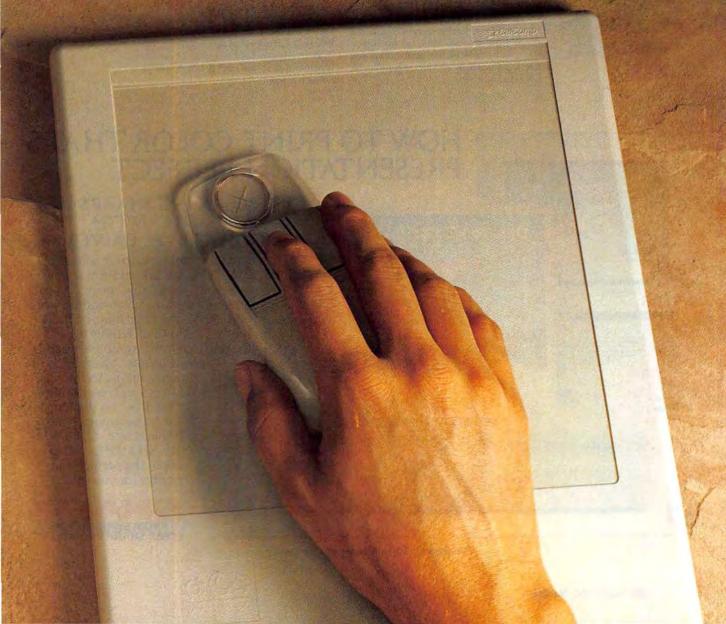
Everything else is just a mouse.



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Historic.



E-D-I-T-O-R-S' C-H-O-I-C-E

from Digidesign for the Mac II family is changing all that. For less than \$1,000, your Mac can be a plug-and-play, CD-quality direct-to-hard-disk recording studio equipped with a host of editing tools; the final mix is easily spliced into HyperCard, SuperCard, or Director productions.

HONORABLE MENTIONS

Three sequencers (MOTU's Performer 3, Passport's Pro4, and Opcode's new Vision) and three notation programs (Passport's Encore and Coda's Finale 2.0 and MusicProse) all raised Mac-based production standards. But two educational products stood out: Hip Software's Harmony Grid, a visual-based alternative to audio-based music-theory lessons, and Voyager's HyperCard annotations to Beethoven's 9th Symphony, which uses a CD-ROM player to synchronize music and commentary.

BEST EDUCATION / EXPLORATION PROGRAM

Interactive Physics

Mac educational software finally matured in 1989. Interactive Physics 1.0 from Knowledge Revolution is a perfect example of educational software that's powerful, adult, full-featured—and fun. In a MacDraw-like environment, you create experiments by playing "what if" with the Newtonian world.

HONORABLE MENTIONS

Honorable mention goes to another favorite, Voyager 1.2, the extraordinarily comprehensive planetarium-on-a-disk from Carina Software. Math Rabbit 1.0 from The Learning Company deserves mention for its lively batch of number and logic games for younger users.

BEST RECREATION PROGRAM SimCity

Maxis' SimCity 1.1 is a new breed of game — an interactive simulation that puts you in charge of an urban area. As you struggle to build houses, industries, and roads, the simulator uses real-world data to create the consequences of your actions: pollution, traffic jams, and urban blight, with a few disasters (floods, earthquakes, Godzilla) thrown in for good measure. A separate Terrain Editor lets you custom-design the landscape, and there's a snazzy 16-color version for the Mac II.



Cosmic Osmo is the surreal interactive HyperCard space adventure from Activision. Where in Europe Is Carmen Sandiego? from Broderbund is the third in a series of excellent educational games that teach geography through a detective motif.





A•W•A•R•D•S





Apple Portrait Display

There are many full-page displays for the Mac, and the Apple Portrait Display stands out above the rest. The time and attention to detail that went into making the product has paid off. It simply offers a sharper, squarer, flatter, and brighter image than its competitors.

HONORABLE MENTIONS

Tektronix's TekColor color-picking system was a serious contender for bringing us closer to true color WYSIWYG. Nonetheless, it was edged out by two superb monitors. Barco is the first monitor manufacturer to incorporate sophisticated calibration technology into its Barco Calibrator monitor, marketed also as a complete system with the ColorBoard 724 video card by RasterOps. And the PCPC Shadowgraph was our hands-down price/performance winner in the October '89 Labs Report on gray-scale monitors.



BEST VIDEO BOARD

SuperMac Spectrum/24 Series III

Value and performance are the goals of new display cards. The SuperMac Spectrum/24 Series III fared best, with widely desirable HARDWARE PRODUCT OF THE YEAR

Macintosh Portable he Macintosh Portable was quite an engineering achievement, squeezing a 100-percent Mac into a briefcase-sized package assembled like a jigsaw puzzle, without screws.

HONORABLE MENTIONS

The Microtek MSF-300Z is an affordable highresolution fullcolor and grayscale scanner that's bundled with some of the best photo-



retouching software for the Mac. The SuperMac ColorCard/24 sports hardware panning and zoom, a virtual desktop in lower-bit modes, and accelerator-readiness.

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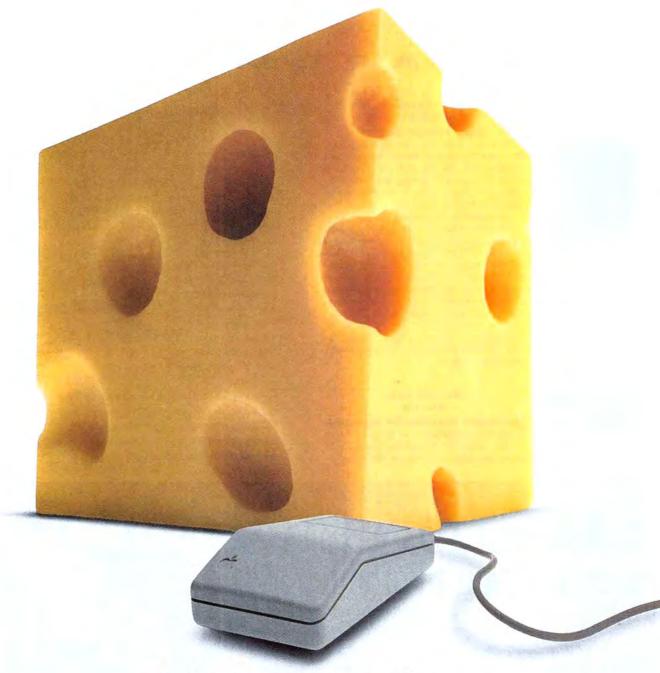
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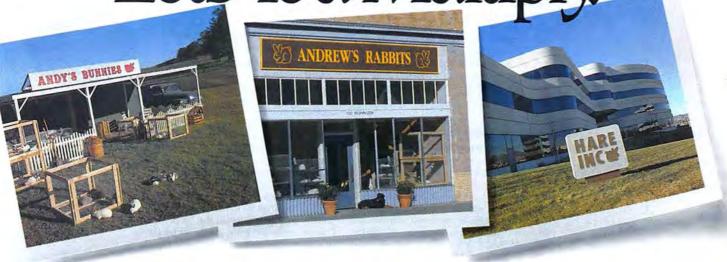
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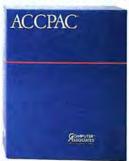
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features such as an integrated 32-bit-Quick-Draw accelerator, hardware pan and zoom, a high refresh rate, a virtual desktop, easy configuration, and support for a wide range of monitors.

HONORABLE MENTIONS

The Mass Micro ColorSpace IIi combines video genlocking capability with three NTSC video inputs to provide simultaneous display of Mac graphics and an NTSC signal. When it's combined with the ColorSpace FX board, special effects such as shrinking or rotating live video and displaying live video in a Mac window are also available. The Radius QuickCAD Graphics Engine is an excellent speed enhancer for a Radius 24-bit-color system.

BEST DIGITIZER Microtek MSF-300Z

For this category, we considered products from several families. The Microtek MSF-300Z color/gray-scale scanner is a breakthrough product in price, image quality, and value. It puts full-color, high-resolution scanning within the reach of a broader community. Its bundled software includes Digital Darkroom, PhotoMac Edit, and SuperPaint, which admirably complete the package. Microtek has set a clear

standard for affordable, quality color scanning.

HONORABLE MENTIONS

The HP ScanJet Plus gray-scale scanner from Hewlett-Packard has a winning combination of quiet operation and superb interface software. Wacom's SD510C Digitizing Tablet combines a cordless, batteryless pressure-sensitive stylus with an ultrathin tablet that's an artist's delight.

BEST MONOCHROME OUTPUT DEVICE Personal LaserPrinter II

GCC has broken the QuickDraw laser-printing price barrier with its QuickDraw-based Personal LaserPrinter II, which offers all the capability of more expensive machines, including Bitstream fonts; edge-to-edge printing; ATM compatibility; print spooling; and automated envelope printing with QuickEnvelope, a

HONORABLE MENTIONS

Hewlett-Packard now offers two low-cost printing solutions that provide quiet 300-dpi printing. The **DeskWriter** is a complete ink-jet solution for the Macintosh that ships with a Chooser driver and fonts. The **LaserJet IIP** is an excellent low-cost addition to the LaserJet family.



A·W·A·R·D·S





QMS ColorScript 100 Model 10

The QMS ColorScript 100 Model 10 is the clear leader in the Macintosh color-printing market in terms of performance and price. The Colorscript is true PostScript and one of the fastest printers on the market. The image quality is very good, and the printer is easy to set up and use — a standard by which to judge other color printers.

HONORABLE MENTIONS

Using ink-jet technology, the **Tektronix**ColorQuick provides some of the most brilliant color output of a color printer to date, and as an added bonus, it ships with TekColor, Tektronix' color-table technology for monitors. And the Hewlett-Packard PaintJet XL provides color ink-jet output that rivals that of color printers costing more than twice its price.

BEST STORAGE SYSTEM

MacinStor Erasable Optical

With a 35-millisecond access time, Storage Dimensions' MacinStor drive makes space the final frontier. It's the fastest of the newest class of mass-storage devices, erasable optical drives. Data is stored on either 650-megabyte or 1-gigabyte removable discs.

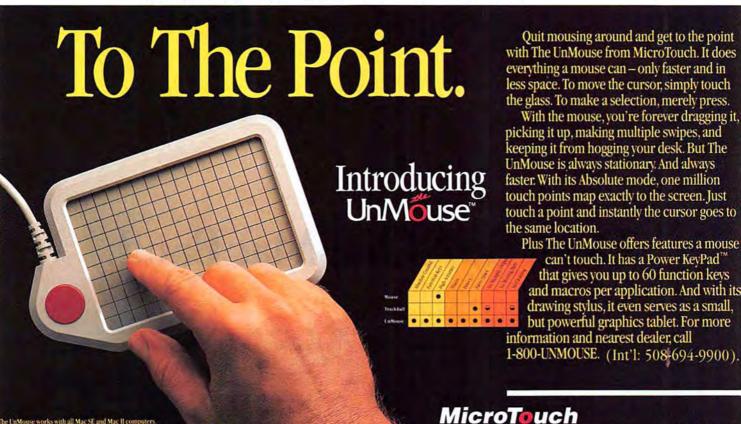
HONORABLE MENTIONS

The Kennect Drive 2.4 and Rapport are an extraordinary duo. The Rapport serves as the interface to the high-density Kennect Drive 2.4, and together they can cram 2.4 megabytes' and 1.2 megabytes' worth of data onto high-density and double-density drives respectively, while also being able to read MS-DOS and Macintosh disks. The UltraDrive S Series hard drives from GCC feature fast mechanisms from Seagate and Quantum and a terrific package of software utilities that include QuickSpool and SUM II.

EDDIES WATCH:

As the deadlines drew near, some promising products didn't make it under the wire. Keep your eyes peeled for: Oscar (Apple), Hyper-Card 2.0 (Apple), A.C.E. (Casady & Greene), Aldus PrePrint, FontStudio (Letraset), FoxGraph (Fox Software), Kodak XL 7700 digital continuous-tone printer, LabVIEW 2.0 (National Instruments), PageMaker 4.0 (Aldus), Personal Press (Silicon Beach), PhotoShop (Adobe), RagTime 3.0 (Unicorn), Studio/32 (Electronic Arts), StuffIt Classic (Aladdin), THINK Pascal 3.0 (Symantec), and TopScan (Calera).





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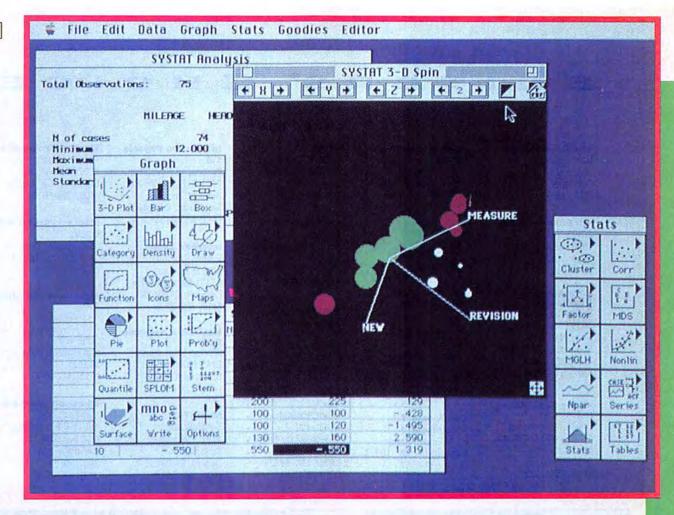
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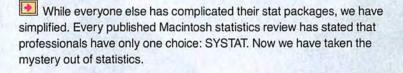
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4th Dimension 2.0

ACIUS, Inc. 10351 Bubb Road Cupertino, CA 95014 (408) 252-4444

Acta Advantage 2.01 KeyPlan 1.0

Symmetry Software, Inc. 8603 E. Royal Palm Road Suite 110 Scottsdale, AZ 85258 (800) 624-2485 (602) 844-2199

Adobe Type Manager (ATM) 1.0

Adobe Systems, Inc. 1585 Charleston Road Mountain View, CA 94039-7900 (415) 961-4400

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Microsoft Word 4.0

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TGS Systems 1127 Barrington St. Suite 19 Halifax, Nova Scotia **B3H 2P8** Canada (902) 429-5642

QMS ColorScript 100 Model 10

QMS. Inc. One Magnum Pass Mobile, AL 36618 (205) 633-4300

QuarkXPress 2.12

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–Doug Clapp, Author



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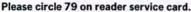
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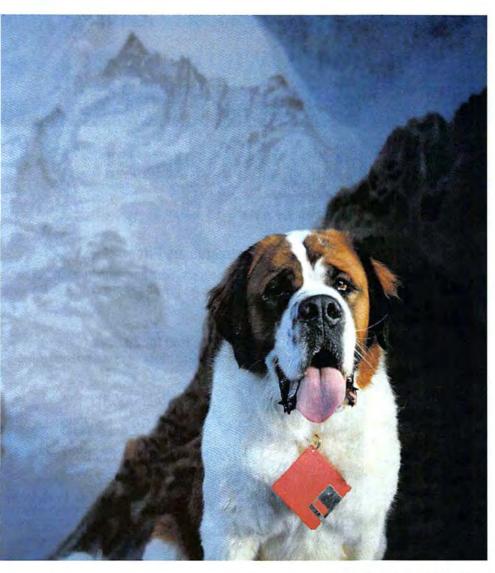
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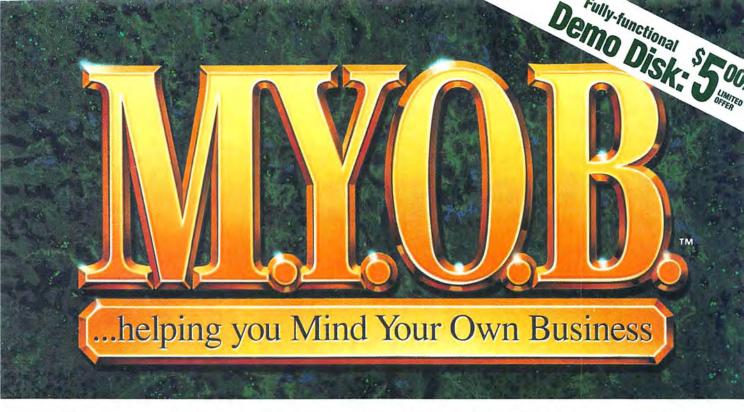
To the Rescue



Disk crashes and data loss can happen at any time. More often than not, you can survive unscathed with the right knowledge and the help of powerful, if not perfect, tools for recovering data and repairing disks.

ou may know that sinking feeling you get when you realize that all your disk's data and the hard work it represents may be lost. You ask the universe why your disk has suddenly gone deader than a stack of hubcaps, and you wonder why you haven't taken the time to back up your work. Once a disk problem does occur, however, there's a lot you can do to recover most or all of your data.

By Leonard Hindus



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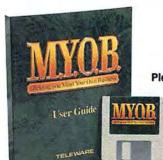
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To the Rescue

First, be aware that the Mac Finder generates apocryphal warnings at the slightest disk disturbance, making it impossible to tell a minor problem from a hard crash. To make matters worse, it then offers to reinitialize the disk and destroy all its data. The chances are very good that your disk data is still safe and sound and that you can recover most if not all your files. Genuine crashes, in which the disk is damaged beyond recovery, are very rare.

Don't accept any offer the system makes to "repair" the disk. In most cases, it can do so, but in attempting to repair it, the system can inadvertently further corrupt vital recovery information. You can try to repair the disk after you've safely recovered its data. The major cause of loss of data

in disk crashes is panic. If you start to reinitialize the disk by accident, shut off the drive's power switch. This is bad for the disk, and it goes against all your instincts, but it still beats losing *all* your data.

Opening a Damaged Disk

If the Mac is unable to mount a damaged disk from the Finder, it may issue an error message and/or refuse to display the disk's icon, making it unreachable by ordinary means. You may, however, be able to access that disk with 1stAid HFS or SUM II. If the damaged disk is your System disk, you'll need to restart the system with another System disk or the 1stAid HFS or SUM distribution floppy. Always remember to lock the master floppy or, better

yet, use a working copy of it.

Problems with Floppies

If you have a damaged floppy, immediately eject and lock it to prevent accidental erasure or further corruption during file recovery. Try inserting the floppy into the drive several times. Often this is enough to correct the problem. Then try inserting the floppy into a different drive or a different Mac. Sometimes the slight difference in head alignment between drives is enough to make the floppy readable. If there are fingerprints or dirt on the medium, the heads may actually scrape it clean during repeated read attempts. Even waiting for better weather might help. I once had a disk that seemed particularly sensitive to humidity levels: If it

Easy Fixes, Hard Disks

External Disks

Choose Shut Down from the Special menu, and then turn off the Mac and the drive. Check to ensure that the SCSI addresses on all your devices are unique. Be especially careful to check the address of any internal hard disks. No two SCSI devices can have the same address (0 through 6), so assign each a different number. Check SCSI cables for proper seating at both ends. Never disconnect or connect a SCSI cable when the Mac or any SCSI peripheral is powered up.

Electronic Noise

An improperly terminated SCSI chain can make the Mac think a disk has failed. Check the hardware documentation, and make sure that the hard-disk drive has a SCSI terminator if it needs one. If the disk is the last device in the SCSI chain,

be terminated. When you've checked these particulars, turn on the drive, wait a minute, and then start your Mac. If your attempts don't solve the problem, turn everything off again and physically disconnect any other SCSI devices from the chain. Power up and hope for the best. If you have a spare compatible SCSI cable, now's the time to try it. With any hard-disk drive, try turning the Mac off and on again. You may need to do this several times.

Dirty Desktops and Bad Drivers

Corruption of either the desktop file or the SCSI-disk-driver software can look like a disk failure. If the desktop file gets damaged, the Finder may not even display the disk's icon, instead displaying the message "This disk needs minor repairs." You can rebuild the desktop by using the Minor Repairs application, which comes with 1stAid HFS, or by holding down

the Command and Option keys at startup and clicking OK at the offer to rebuild the desktop of the problem diek

The SCSI disk driver is the software on your hard disk that loads into the Mac at startup and handles Macdisk communications. A driver gone bad looks like a hard-disk crash. The driver for Apple hard disks is installed with the Update option by the Apple HD

SC Setup utility on the Macintosh Utilities Disk #1. The drivers for other hard disks should come on an included floppy. If you have any questions about reinstalling a specific driver, you should call the disk's vendor.

Because of leeway in Apple's SCSI implementation, your current SCSI driver may not be compatible with a new release of the Mac's System. If you've just updated your system software and you start to have problems for no obvious reason, consider going back to your trusty old System setup. If that cures the problem, you should report the problem to the disk's

manufacturer and ask if there is an updated version of the driver available.

Norman Fong of

FWB Software, which develops SCSI drivers, notes that the new Mac Portable and the Mac IIci use a checksum feature that has been part of the SCSI spec but that Apple has not enforced up to now. As a result, disk-driver combinations that work on the Mac II, IIcx, and SE may not work on the Portable or IIci series.

Call the Drive Vendor

If you're still having trouble with a harddisk drive, call the disk vendor's customersupport line. Support people often hear of obscure disk problems that may baffle your dealer.



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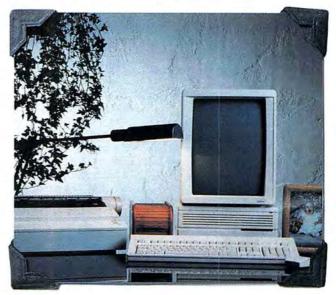
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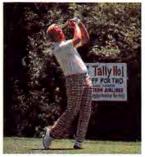
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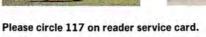
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To the Rescue

rained for a few days, the disk would flake out; after a few days of dry weather, it would mount perfectly.

What you

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damage and

the recovery

the wits of

software.

If your initial efforts still give you the "This disk is unreadable" message, eject the disk and run a floppy-disk-recovery program. 1stAid HFS is the easiest and most reliable floppy-disk-recovery software. You can even try to make a sector copy of the disk, but not with the reluctant Finder. You can use a sector-

copy program such as FastCopy, which comes with PC Tools Deluxe, or SUM's QuickCopy utility. Such programs can repair certain types of directory damage so that the disk can at least be recognized by the Finder.

Whatever the cause or cure, once your disk has been recognized and its icon appears, copy its contents to another disk and try to use the rescued data. Once you're satisfied that it's all there, make a second copy, using the new disk as a master, and give the damaged disk a nice burial.

Recover Your Files First

If disk-revival steps fail, you'll have to recover individual files, although there may be some data you can't recover. What you get and what you don't get depend on the extent of the damage and the built-in wits of your recovery software. Don't create any new files on the problem disk or attempt to print until you have safely recovered your data. The more you exercise the disk, the greater the danger of damaging the data or medium. If you are able to, seek out your most valuable files and rescue them first.

Several software tool kits can recover files from most crashed hard disks and damaged floppies. I tested five such packages – 1stAid HFS, Complete Undelete, and Sector Collector, all from 1stAid Software; SUM II, from Symantec; and PC Tools Deluxe, from Central Point Software. 1stAid HFS is unequaled in floppydisk recovery. SUM II has the unique

ability to scan a badly damaged disk and scavenge for recoverable data, even if the directory has been destroyed. It can sometimes recover data from an accidentally initialized disk too. PC Tools Deluxe is the weakest of the packages, and its current release is not the best choice for disk recovery.

Another disk-recovery package, Norton Utilities for the Mac, from Peter Norton Computing, is still in development and may be available by the time your read this (see the "BetaWatch" sidebar).

Recovering Deleted Files

When you delete a file, the system doesn't actually erase the data in sectors occupied by the deleted file—it merely erases that file's name from the disk directory and frees up its sectors for use by new files. Because no data is lost, it is frequently possible to recover it, but the longer you wait after deleting a file, the greater the probability of overwriting its sectors with new data. If you accidentally delete a file, you must recover it immediately.

Complete Undelete, PC Tools Deluxe, and SUM II provide simple directory-based methods for recovering deleted files. Complete Undelete and PC Tools Deluxe can recover only files deleted after the programs' deleted-file tracking system was installed. SUM II, on the other hand, is the only software that can recover files that were deleted before a deleted-file tracking system was installed.

Leonard Hindus is CEO of Ribbledale Communications, Inc., a certified Macintosh developer and marketing-communications service located in Hudson, Massachusetts.

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To the Rescue

Sticky Disks

If you have a Mac II, Ilcx, or SE with an Apple 40- or 80-megabyte hard disk, you may be the victim of a sticky disk, meaning that the disk sticks during power-up. The disk icon never appears on the desktop because the disk never makes it past its own self-test. Fortunately, this problem doesn't affect stored data.

Apple's 40-megabyte Seagate model #ST1576 drive has a problem that Apple calls stiction. Sometimes the read/write heads stick to the disk platter and keep the disk from spinning. Because the heads normally rest in a special nondata area, this doesn't harm the data — but you can't read it either. When Apple's Quantum 40- and 80-megabyte drives start up, the heads may get stuck, preventing the disk from being properly recognized and causing random system crashes.

Apple maintains that it will repair or replace sticky hard disks — even those with expired warranties. Moreover, it'll reimburse users who have had their Apple hard disks serviced at their own expense. Apple has even announced a formal recall on Seagate 40-megabyte drives with serial numbers 335507 to 1250863.

Quantum drives with PROM version 7.9 01 should be dealer-upgraded to version TA.2 01. The PROM chip is mounted onto the drive's controller board. The replacement offer will end after October 1991.

Apple has also promised to recover the data stored on faulty drives. In my case, however, the company couldn't do it. If you have a sticky Apple disk, call Apple customer service at (408) 252-2775.

Beta Watch: Norton Utilities for the Macintosh

Peter Norton Computing has pioneered the concept of disk-diagnosis and -recovery software on the PC. The company is now working on a Mac version that it has vowed not to release until it's up to the high standards set by its PC products.

The goal is to combine the detailed reporting and meaningful diagnostics of 1stAid Kit with the robust recovery power of SUM II.

A peek at an alpha version of the software looked promising. If the release version of Norton Utilities for the Mac is anywhere near as good as promised, it will give SUM II and 1stAid HFS a run for your money. Look for a release in the first quarter of 1990. Peter Norton Computing, Inc., 100 Wilshire Blvd., Santa Monica, CA 90401; (800) 365-1010.



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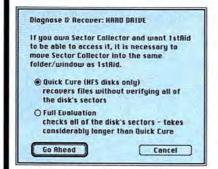
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*Stew Costa, MacWEEK, 10388, **MacUser 1989: Editor's Choice, 5 Mice Rating, and Eddy Award for Best Utility, Macworld's 1989 Reader's World Class Award. Best seller through National Distributors: Ingram Micro D, Softsel, Kenfil, SUM is a trademark of Symantec Corporation. Macintosh is a registered trademark of Apple Computer, Inc. & 1990 Symantec Corporation

Capsule Reviews

1stAid HFS

1stAid HFS combines meaningful disk diagnostics with an excellent file-recovery facility and a general-purpose troubleshooting guide for the Mac. It lacks a scavenging capability for hard disks, so it cannot recover disks whose directories are destroyed. However, through its detailed reports about recovered files, you know the quality of what it does recover. Unfortunately, 1stAid HFS also lacks a facility for maintaining a duplicate copy of the disk directory, which removes a strong line of defense against crashes. Its recovery capabilities for floppy disks are excellent, however. Even if you use it only to recover flaky floppies, no Mac should be without 1stAid HFS.



1stAid HFS has a Diagnose & Recover feature that can check your disk's integrity, and its Quick Cure option is a good first step if you suspect a disk problem.



1stAid HFS and Sector Collector both display this status dialog box and update it as the verification progresses. The software comes with a wealth of detailed documentation. In fact, it is often too detailed. It took a call to customer support before it became obvious that the lists containing cross-referenced error messages, keywords, and descriptions of abnormal behaviors are crucial recovery tools. These lists are hidden in the middle of the manual. When you get an error message, the Error Message List references the page on which you can find the appropriate solution. It would significantly improve the manual if this key feature were presented up front.

Floppy-Disk Recovery. 1stAid HFS' ability to recover files from damaged floppies is no less than spectacular. It repeatedly recovered more data from damaged floppies than did SUM II. It has several modes of floppy recovery and a Quick Cure option. Diagnose and Recover is the same directory-based recovery technique that 1stAid HFS uses to analyze and recover hard disks. The Quick Cure option scans the directory, generates a diagnosis of the disk, and offers recovery options.

You can select some or all of the files to be recovered. As 1stAid HFS proceeds, it warns you about files with bad sectors that it had to replace with empty ones. In my experience, especially with floppies, sectors that are unreadable in one attempt may be readable on the next try. If you make repeated attempts to recover a file containing bad sectors, you can eventually recover the entire file.

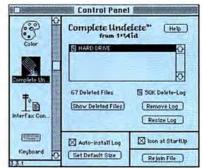
Salvage Files by Tags is a sector-by-sector scan-and-salvage recovery technique that may be able recover some data from floppies too damaged for any other technique to work. It uses sector tags, which are short data fields at the beginning of each in-use sector that contain the identity of the file that owns them. Using tags as a guide, this utility can recover data even if the floppy's directory has been destroyed. Mac hard disks, unfortunately, lack sector tags.

Copy Diskette is the easiest but least effective method for recovering floppy disks. It attempts to copy the files from one floppy to another, sector by sector, summarizing how many bad sectors had to be replaced with zeroed-out placeholding sectors.

1stAid HFS can also view and extract the text in files. I found this especially useful for recovering text from Word 4.0 Temp files, which contain the latest state of your Word document and remain on-disk after a crash.

Complete Undelete

Complete Undelete from 1stAid Software is a powerful and easy-to-use utility, accessed through the Control Panel, for listing and recovering deleted files. It can recover what's left of deleted files, some of whose sectors have been reassigned to new files. You have the



Complete Undelete is customized through the Control Panel. You can examine the current list of deleted files and choose the amount of disk space to set aside for the program's bookkeeping and recovery information.



Complete Undelete's informative Deleted Files list lets you know valuable date and time information and indicates the present state of each deleted file.



Complete Undelete's text-preview option lets you examine the text in a deleted file to quickly verify that it's the file you expected.

options of replacing the missing sectors or of extracting any available text. Complete Undelete can undelete only files that have been deleted after you have installed the utility into your System Folder. It was able to recover and render openable deleted and partly reassigned files that SUM II and PC Tools Deluxe could not recover. SUM II and PC Tools Deluxe, on the other hand, were able to recover some files that were deleted before any deleted-file protection was installed.

Complete Undelete provides a summary of all deleted files, showing which ones can be recovered intact. You can view deleted files by date of deletion, alphabetically by name, or by creator, which is handy if you want to recover a specific file.

When you select a file for recovery, the program shows the number of sectors in each deleted file, the number of missing sectors, and the percentage of the file that can be recovered. As a safety feature, Complete Undelete doesn't try to recover partially overwritten applications. A convenient preview section lets you look at deleted files before they are recovered and even extract any available text.

Sector Collector

Sector Collector is a handy diagnosis-andrepair utility for detecting and isolating bad sectors on hard disks and floppies. Although it can be used by itself, Sector Collector was designed to be used with 1stAid HFS. It can recover files by collecting their good sectors and replacing their bad ones.

It verifies the disk and generates a detailed report, but it does not automatically lock out bad sectors, which would permanently prevent their reuse. Instead, it has a unique option for assigning unused bad sectors to an invisible file; this approach takes bad sectors out of circulation so they don't get assigned to your good files. Sector Collector also has a recovery option for recovering files that are partially composed of bad sectors.

The separation of the sector-validation and collection functions is important because certain types of SCSI-bus or system problems can make it look as though you have many bad sectors on a good disk. If the verification detects more than a couple of bad sectors, you can repeat the verification several times and then take corrective action.

SUM II

SUM II is a set of utilities that includes datarecovery and data-loss-prevention tools. SUM II is the only recovery application that can recover data from disks whose directories have been damaged and for which no preventive measures have been previously taken. Unfortunately, SUM II doesn't tell you when it can't read a bad disk sector, so you don't know if a file has been successfully recovered until you try to use it. Running incompletely recovered applications can cause serious problems.

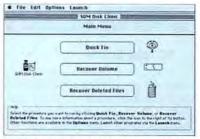
After the Crash. SUM II can search a disk for recoverable files and can also locate and undelete files, even if you've never loaded it on your system before. It can take hours to scan a large disk, but considering the alternative, it's worth the wait. SUM doesn't generate its found-file report until the scan has finished, so if you interrupt a search, the time invested up to that point is wasted. Once it has listed the files, it can sort them by name, type, and date.

SUM's Floppy Recover option can help extract floppy-based data, but in my attempts, the recovered files proved unusable. According to Symantec, Floppy Recover is the least effective recovery method and should be used only if the Volume Scan option fails to recover all the known files.

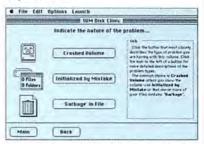
Before the Crash. SUM Shield is a preventive utility that creates a copy of your disk's directory in a Volume Restore Record and keeps a record of deleted files in a Deleted File Record. You can keep both records or copy them onto another disk and update them whenever you update the original, which gives you an extra measure of protection. If your disk's own directory is damaged, SUM can use its Volume Restore Record to locate files quickly. If the disk suffers a hardware crash, this can make the difference between recovery and loss.

You can update the Volume Restore Record at specified intervals with a keyboard command or have it done automatically at specified intervals or when you shut down. If you use your Mac intensively, you will want to specify frequent updates. Unfortunately, even under MultiFinder, the directory-backup process temporarily interrupts the current application, which some fax utilities and communications applications may not tolerate. Using a timed backup can be a godsend, but it has potential dangers because you may have files open or in transitional states.

Undeleting Files. If you discover that you've accidentally deleted an important file and you don't have a recent backup or a deleted-file-recovery package installed, SUM II is your only hope. Although its scan method isn't foolproof, it gives you a fighting chance. SUM II's recovery based on the preinstalled Deleted File Record provides a more reliable and painless revival in most cases. As with its other file-



SUM Disk Clinic presents you with this initial set of options, which then usher you through a chosen function. As simple as it looks, navigation is not nearly intuitive enough for those less experienced.



A deeper level in SUM Disk Clinic lets you specify what you suspect is the problem with your disk or files.



SUM II has two ways to recover deleted files. One method is highly reliable as it keeps track of deleted files through a preinstalled utility.

recovery methods, SUM II doesn't report badsector problems with recovered files.

SUM II's disk-repair side includes SUM Tune-up, which can detect and automatically lock out bad sectors, as long as the sectors are not already assigned to a file. Unfortunately, SUM II lacks a scan-only diagnostic mode. The automatic sector lockout could be dangerous if some problem in your disk cable or connector falsely indicated bad blocks, and it could cause loss of a great deal of disk space by having good blocks rendered inaccessible.

Capsule Reviews

PC Tools Deluxe

The PC Tools Deluxe package is not a viable disk-recovery system, because it fails to provide any hard-disk file-recovery capability. It does include a floppy-disk-recovery application, which uses sector tags, and two-tiered deleted-file recovery for hard disks and floppies. In my tests, however, neither method worked very well with files that were partly overwritten. PC Tools Deluxe's file-undeletion system, CPS Delete Tracking, is unable to install on the same system as SAM (Symantec's virus detector) or 1stAid Kit's Anti-Virus.

The only hard-disk-recovery feature it includes is an application called Mirror that stores a duplicate directory on the same or another drive. A companion application called Rebuild can restore the directory from the duplicate. The Mirror directory is updated only on system shutdown, so the Rebuild application loses any new data files created since the system was turned on. This approach can easily overwrite directory information that SUM II or 1stAid HFS can use to recover your disk.

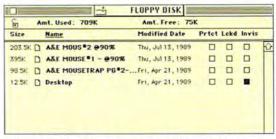
The manual's cover promises "Disk Recovery: Recover data from magnetically damaged diskettes and hard disks." However, the system does not have a single feature that can recover data from magnetically damaged hard disks, unless only the directory is damaged.

The package claims to have "the best undelete available. Instead of guessing, it recovers data even from fragmented files." When I tried using either of its recovery schemes, I was unable to recover and open files in which some sectors had been overwritten.

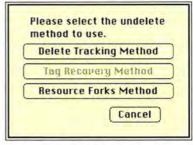
When I used PC Tools Deluxe's dedicated function, PC Backup, to back up one hard disk to an-

other, I couldn't recover the backup, because the restore process presumed that I had backed up to floppies, even though it let me back up to a hard-disk volume. When I ran the Verify Disk function, the cursor remained an arrow, leaving me only hoping that the verification was running. Although it does not fix bad sectors, it reports each error and its sector number, stopping each time to wait for your acknowledgment. It doesn't produce a final report, nor does it tell you what file the bad blocks belong to.

PC Tools Deluxe may be a dandy set of techy utilities, but for disk recovery, it falls somewhat short. It looks as though it was brought to market too soon. Central Point Software says it will fix all these problems and introduce real recovery features in the next release.



PC Tools Deluxe has a MacTools utility, which gives you control over several key attributes of files and lets you see and manage files that aren't normally visible.



PC Tools Deluxe offers two methods of recovering deleted files. The most reliable is the Delete Tracking Method, which requires preinstallation of a utility that stores recovery information about deleted files.

How Deleted-File Recovery Was Tested

I deleted several files, including a long MacWrite file, from an Apple 80-megabyte hard disk. I also wrote other files to the disk to deliberately overwrite some of the deleted files' sectors. I then tried to recover these files with SUM II, PC Tools Deluxe, and Complete Undelete.

Complete Undelete

This tool gave me a comprehensive list of deleted files. When I selected my MacWrite file, it told me 49 of the original 147 sectors were missing. The Preview feature showed that a large block of text could be recovered. I then recovered the file twice — once by extracting the text and once by zeroing out the

reallocated sectors, and replacing them with empty ones. Both Word and MacWrite were able to read and work with the resulting versions of the file. Complete Undelete was the only software that consistently recovered deleted files, whether they were intact or partially overwritten. Consider this as a mandatory feature.

PC Tools Deluxe

This application's MacTools utility provides two methods for recovering deleted files on hard disks: CPS Delete Tracking and the Resource Forks Method. The Resource Forks Method failed to locate many deleted files, perhaps because the files lacked resource

forks. With CPS Delete Tracking, I tried to recover several files that PC Tools Deluxe listed as being complete and recoverable, but I was unable to open the recovered files.

SUM II

I tested deleted-file recovery by using the Scan and Deleted File Record options. The Deleted File Record recovery of my partially overwritten MacWrite file generated a recovered file I could not open with MacWrite or Microsoft Word 4.0. I did finally manage to view the text using 1stAid Kit. The search with Scan failed to find several deleted files, including the long MacWrite file I wanted to recover.



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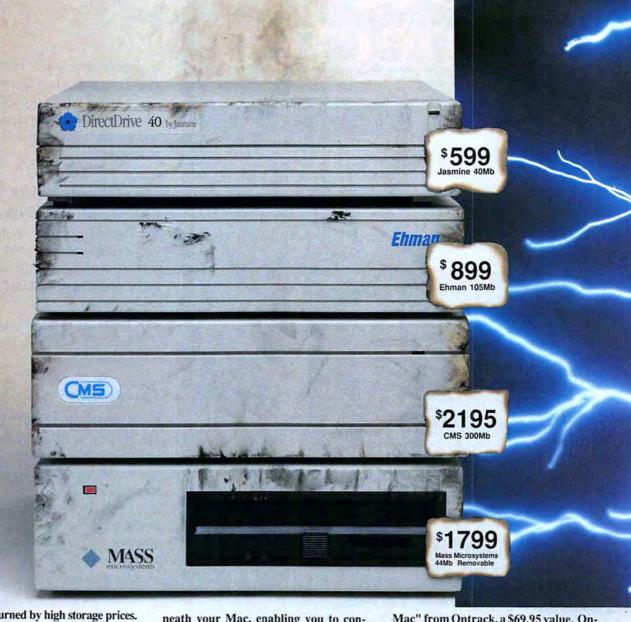


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A n g l e d



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The Bottom Line

Right now, no single product provides all the features you need for hard-disk diagnosis and recovery. 1stAid Kit is easy to use, provides meaningful reports, and is great for floppy disks, but it can't recover the contents of a hard disk if the directory is badly damaged. SUM II can recover disks with damaged or destroyed directories, but it doesn't warn you about any bad sectors in the recovered files, so you can never quite trust the quality of the recovery.

Complete Undelete, with its partial-recovery and text-extraction features, provides the best deleted-file recovery, as long as you have preinstalled the software.

PC Tools Deluxe has a hard-disk file-recovery capability that produces acceptable recoveries only if just the disk directory is damaged. It also offers a deleted-file-recovery system that requires preinstallation. With files that have been partly overwritten, however, its recovery methods fail to produce recovered

files that their creating application can read. By all means, install a file-and-disk-watchdog utility before you find that you need one.

SUM has the widest set of capabilities for a single package, but a combination of SUM II and 1stAid HFS makes a far safer and more complete kit for diagnosis, recovery, and repair. If you can afford it, buy SUM II, 1stAid HFS, Complete Undelete, and Sector Collector, as they can each prove vital for some aspect of recovery.

Report Cards

Complete Undelete 1.02 \$\$\$\$\$\frac{1}{2}\$

Complete Undelete has excellent deletedfile-recovery capabilities for files deleted after its installation. It has an easy-touse cdev for listing and recovering deleted files and can recover what's left of deleted files whose sectors have been partly reassigned to new files.

Pros: Provides a summary of each deleted file's quality. Deleted files can be viewed and sorted in several ways. Can recover and render openable deleted and partly reassigned files.

Cons: Can undelete only files that have been deleted after you installed the utility into your System Folder.

Requires: Mac 512KE or later. List Price: \$49.95.

1stAid Software, 42 Radnor Road, Boston, MA 02135; (617) 783-7118.

1stAid HFS 2.8

Collector.

titi 1stAid HFS combines disk diagnostics and general-purpose troubleshooting with an excellent file-recovery facility. It can generate a summary of a disk's condition and suggest recovery options. Also available is a package called 1stAid Kit Deluxe that contains 1stAid HFS, Complete Undelete, and Sector

Pros: You know in advance the quality of what's recovered. Ability to recover files from damaged floppies is excellent.

Cons: Recovery system depends on the prior installation of its protective utility. Can't recover files from hard disks that have destroyed directories. Lacks a facility for maintaining a duplicate copy of the disk directory.

Requires: Mac 512KE or later.

List Price: 1stAid HFS, \$99.95; 1stAid Kit

Deluxe, \$159.95.

1stAid Software, 42 Radnor Road, Boston, MA 02135; (617) 783-7118.

PC Tools Deluxe

PC Tools Deluxe is a collection of utilities for disk and file handling. It includes a utility that stores a duplicate disk directory on the same or another drive. A companion application uses the duplicate directory to recover a hard disk if its working directory is damaged.

Pros: Does deleted-file recovery for hard disks and floppies and includes a floppydisk-recovery application that uses sector tags. Other utilities let you do encryption, disk backup, and optimization. Good documentation that's not for the fainthearted.

Cons: Duplicate directory for hard-disk recovery is updated only on system shutdown. Lacks an easy-to-use harddisk file-recovery capability if you have not preinstalled its protective utility. PC Backup backs up one hard disk to another but presumes that you've backed up to floppies, even though it lets you back up to a hard disk.

Requires: Mac 512KE or later with 800K internal drive.

List Price: \$79.95.

Central Point Software, 15220 N. Greenbrier Parkway, Beaverton, OR 97006; (503) 690-8090.

Sector Collector 1.0 \$\$\$\$\$\frac{1}{2}\$

Sector Collector is a handy diagnosis-andrepair utility for detecting and isolating bad disk sectors. It can recover files by collecting good sectors and replacing bad ones. It can also optionally take bad sectors out of circulation. It verifies disks and generates reports.

Pros: Bad-sector-assignment method is workable and easy to undo.

Cons: Reformatting a disk releases the bad sectors for use unless you collect them immediately.

Requires: Mac 512KE or later. List Price: \$49.95.

1stAid Software, 42 Radnor Road, Boston, MA 02135; (617) 783-7118.

SUM II 2.0 ****1/2

SUM II can work wonders in recovering deleted files or data from a crashed disk. Once SUM II is installed, its recovery methods are based on the Volume Restore Record, which can be updated at specified intervals, and the Deleted File Record.

Pros: Recovers and undeletes data from disks with damaged directories, even when no preventive measures have been previously taken.

Cons: No warning when a disk sector in a recovered file can't be read. SUM Tuneup's method of reassigning bad blocks on detection should be an option rather than a no-choice event.

Requires: Mac Plus or later, System 4.2 or later, and Finder 6.0 or later.

List Price: \$149.95

Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; (408) 253-9600.

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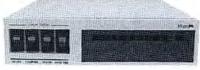
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Tax tips for all—from beginners through pros Reformers

New products and

By Scott Beamer

f all or most of your taxable income appears on your W-2 form, the best package to use for your tax return may be the one Uncle Sam sends you. Just sharpen your pencil, and get to work. It shouldn't take you long.

If your taxes are less straightforward, you may want to use Macintosh software. Many people, myself included, have done so and have been pleased with the results.

To decide whether to do your taxes on your Mac, ask yourself: Are you uncertain about itemizing deductions? Do you have investments in the stock market or elsewhere? Do you have an office at home? Have





you started a small business? Are you thinking of buying or selling a home? Are you getting married (or divorced)? If you answer yes to any of the above, your tax situation may be complex enough to warrant software help.

If you use a software tax package, I strongly recommend that you have a professional tax preparer check your returns. The program can ensure that you don't make any arithmetical mistakes, but you need an expert to make sure you don't make any strategic ones.

Which Package?

Mac tax software is available for all, from beginners through professional preparers. You fill out onscreen representations of various IRS forms, print them, sign them, and send them in to the IRS. Here's a quick run-through of what's currently available: Personal Tax Templates from Heizer Software, Bottomline Personal Edition from compu-CRAFT, TaxSmith from Island Computer Services, Tax Pro from Chesapeake Software, and MacIn-Tax Federal from SoftView.

A tax template is a spreadsheet data file with graphics and formatting entered to make it look like a tax return. It calculates taxes based on your entries and transfers appropriate data from previous pages or other forms, thereby relieving you of much of the work of filling out a tax return. Spreadsheet jockeys usually prefer to do their taxes with a template package because it's inexpensive and lets them link in their own worksheets and customize forms and worksheets when appropriate.

Currently, only Microsoft Excel and Works tax templates exist for the Mac. If you have a different spreadsheet program, you're out of luck. Perhaps next year, Full Impact will be able to import Excel templates too. (Just before this article went to press, Informix announced that a version of Wingz will be available that can import Excel 2.2 files with formulas, linking, and formatting intact. This means that Wingz owners may be



Tax Reformers

able to use tax-template packages from compuCRAFT and Island Computer Services.)

The oldest and best-selling template package for the Mac is Personal Tax Templates. The 1989 package includes about 35 forms; a worksheet for all types of depreciation; and CheDIT, a check register that helps summarize your records. All forms are appropriately linked, and a startup macro lets you open the combination of forms you wish to work with. The documentation is skimpy, but at \$35, the package is an excellent value.

State tax forms are available for California, New York, and Minnesota. Other templates print W-2s and calculate IRA deductions. Most templates work with Works. Heizer's templates are popular with professional preparers, and the Business disk now includes forms 1120, 1120-S, and 1065, as well as some of the less common individual-return forms.

Heizer offers technical support by phone and tax advice on-disk in the 1040 HyperTax Guide (1989).

With Bottomline Personal Edition, compuCRAFT offers many IRS forms on a single disk, with business and estate forms on separate disks. A disk containing just the short form (1040A) is also available. This year's forms work only

with Excel 2.2, because the current version's superior text- and graphics-handling abilities render IRS forms more precisely. At press time, compuCRAFT had not decided whether to include state forms.

Apparently adopting the philosophy that less is better, Island Computer offers a variety of modest Excel

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Figure 1: When you first open the 1040 form in Heizer Software's 1989 Personal Tax Templates, this W-2 worksheet appears. Enter the information from your W-2s, and it appears totaled in the appropriate places throughout your return.

packages, all versions of its TaxSmith software. The basic TaxSmith Quick provides a 1040 form with schedules A and B. TaxSmith Family has 6 forms, and TaxSmith Full includes 17. A version for professional tax preparers is also available. All these versions include linking, macros, dialog boxes, custom menus, and a

A New Ball Game — Professional Packages

Although professional preparers have used Mac tax packages for years, they have had to make do with the same packages you and I use. Now there are some packages specifically aimed at professionals — Tax.Smith.Pro from Island Computer, TaxView Professional Edition from SoftView, Bottomline Professional Tax Solutions from compuCRAFT, and possibly Tax-Magic Pro from Datax. (None were available for review at press time.)

Tax.Smith.Pro, the smallest template package, makes no attempt to provide a complete set of forms. Instead, it aims at tax practitioners whose clients generally file simple returns. The disk has the three indi-

vidual packages (Quick, Family, and Full) plus some other common combinations of the same forms.

Those looking for the most complete package will inevitably be drawn to TaxView Professional Edition. Not only does it have a fairly complete set of business forms, including payroll returns and expense forms, but it also offers the only electronic filing service for the Mac this season.

TaxView Professional Edition offers forms 1040, 1065, 1120, and 1120S, either separately or in one package. The professional version has many of the same features as MacInTax does but adds functions sure to please professionals, such as the ability to override

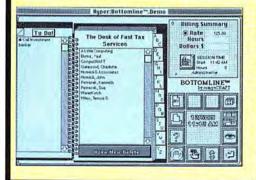
Figure A: compuCRAFT's
Bottomline Professional Tax
Solutions uses a HyperCard
interface to manage client
and billing information.
Client information entered in
the stack appears on the
forms set, which you can
open in Excel by clicking on a
HyperCard button. The billing
timer at the upper right tracks
time while you're using other
applications.

any automatically calculated entry.

A Client Status report shows how each return is progressing, and a batch-export feature allows selected information from each client's return to be exported as text to a spreadsheat or to a word processor for mailmerge. Of course, TaxView supports batch printing.

Some tax preparers prefer to use templates because they are easy to link to existing client worksheets and they give preparers control over how depreciation and other entries are calculated.

Bottomline Professional Tax Solutions provides a HyperCard front end to Excel tax templates. The two programs work interactively - a click on a button automatically takes you from HyperCard to Excel, with the forms already open. The Client Services Manager stack keeps vital statistics for each client, which it can enter on tax forms automatically. A summary statement of work activity is kept linked to each client document. The Billing Manager can base invoicing on an hourly rate, a flat rate, expenses, or a combination of these. It does payment tracking, a billing summary, and in-office reports. Bottomline's individual tax templates - including Individual, Estate, and Business - all work with the Professional Tax Solutions package.





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Not only do you get the broadest range of utilities available, but each function sets new standards for performance. For instance, let's say you want to undelete a trashed file. Using a selective search, MacTools locates likely candidates and lets you view their contents prior to recovery—so you don't waste time or retrieve unwanted files. No other utility even comes close.

So why settle for some, when you can have it all?

MacTools Deluxe...from the leading developer of Macintosh utilities since 1984.

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×		П	Minor File Repair
×	×	П	Disk Protection
×	×		Hard Disk Crash Recovery
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×		×	Data Compression
×		×	Multiple Setup Files
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×	×		Hard Disk Partitioning
×		П	Automount w/Password Prompt
×	×		Hard Disk Optimization
×			Complete Disk Erase
×			Color Disk Map
×	×		Secure/Encrypt File
×			Desk Accessory
×	×		Fast Floppy Copying
×			File Management

Central Point Software INC

tax planner. The TaxSmith packages will be shipped as Excel 2.2 templates, but those people who are still using Excel 1.5 can get a compatible version.

Despite its name, Tax Pro 1989 is not so much for professional preparers as for average users. Compatible with Excel, Tax Pro has 13 IRS forms plus some worksheets. No state forms are available. Although some people will prefer to buy another package with more forms for the same or less money, many will find that Tax Pro has all the forms they need.

A Stand-Alone Tax Package

SoftView's MacInTax is by far the most popular tax package for the Mac. It contains all the forms most of us need, as well as complete instructions from the government 1040 booklet and numerous worksheets and special tools. The package's popularity comes from its high-quality onscreen representations of IRS forms. MacInTax does the arithmetic, enters as much information automatically as it possibly can, and provides worksheets to simplify complex calculations or give you more space. It even has a list showing which forms you've used, which are complete (with all the necessary blanks filled in), and which still need work.

MacInTax provides several state tax forms — for California, Connecticut (with New York nonresident), Illinois, Massachusetts, New Jersey (with New York nonresident),

After April 15

After mailing your returns, you can reflect on your financial situation. Would you like to guess what your taxes will be next year? Are you considering an action that will have a major effect on your finances? Would you like to set up a financial plan for the rest of your life? Your Mac can help with these things too.

You already have the handiest possible package for estimating next year's taxes—the one you used to file this year's returns. You probably have a good idea of what changes to expect in income and expenses. Make the changes in a copy of this year's returns, and see the result.

Would you like to do this in a more precise manner? Heizer Software, Island Computer Services, and SoftView offer tax planners that let you estimate your taxes for different years and with alternative strategies. Many professionals use such packages for advising their clients.

Another way to get a handle on your financial situation and make preparing next year's tax returns even easier is to start using a personal financial-management package. MacMoney, Managing Your Money, and Quicken are three popular programs for the Macintosh. Any of them can help you pay your bills, balance your checkbook, and make a budget you can stick to. Best of all, they provide year-end reports

with income and expenses totaled and ready for entry on your tax returns. Managing Your Money also includes a tax module that gives you an up-to-the-minute assessment of your tax situation throughout the year.

From Survivor Software, you can buy TaxMatch, a HyperCard stack that allows you to assign numbers directly from your annual report to lines on your tax return in MacInTax. All three programs mentioned above can produce ASCII text files from the annual reports that you can then import into MacInTax.

Survivor Software Ltd.

11222 La Cienega Blvd., Suite 450 Inglewood, CA 90304 (213) 338-0155 MacMoney, \$119.95 Tax Match, \$5

Meca Ventures, Inc.

327D Riverside Ave. Westport, CT 06880 (203) 226-2400 Managing Your Money, \$219

Intuit

66 Willow Place Menlo Park, CA 94025 (415) 322-0590 Quicken, \$59.95

New York, Ohio, and Virginia. A converter included in the package automatically fills out as much of the state forms as possible from the information on your federal return. The same converter can give the people

who used MacInTax last year a head start on filling out this year's tax return.

My favorite tool in MacInTax is the Itemization window. Doubleclick on any line on the form in

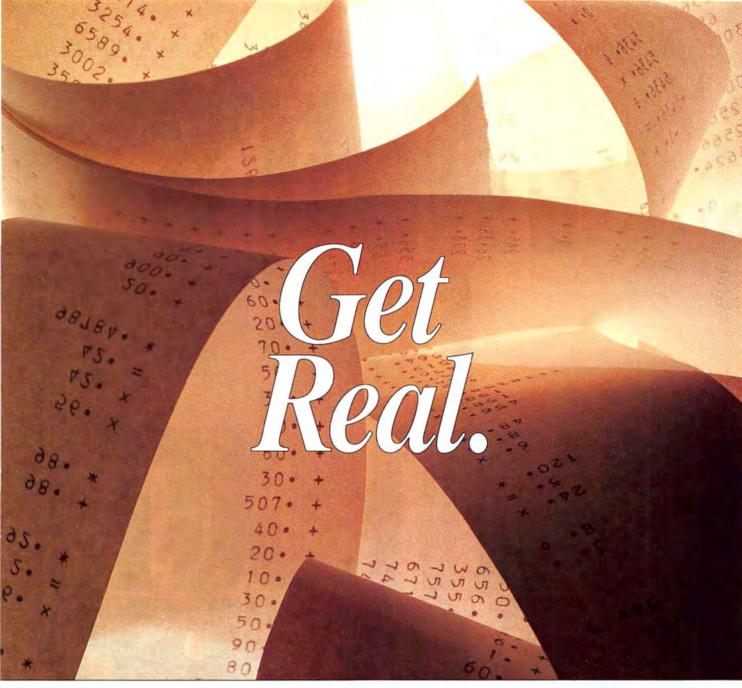
> which you can enter data, and a small window pops up that allows you to enter additional information. The program sums the data automatically, and the total appears on the form. You can use Itemization windows to note how or why you did things a particular way, and you can print the notes for



Figure 2: Bottomline Personal Edition from compuCRAFT uses a HyperCard stack to start things off on the right foot before you shift to tax templates in Excel.

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Figure 3: TaxSmith's Conscience macro tries to relieve some of the tedium of filling out tax returns with a random assortment of humorous warnings.



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(ACCOUNTING SYSTEMS)

Champion

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Tax Reformers

yourself or as supporting documentation for the IRS.

Softview has reduced the price of the standard MacInTax package by \$20 this year and has added a firstclass manual. Some of the other tax packages have manuals, but none are more than a few pages long.

Individuals are not allowed to file their returns electronically with the IRS, but SoftView offers an electronic filing service called Insta-Refund. For \$29.95, the service accepts MacInTax returns and files them for you. This service is available only if you expect a refund. This year, you must send your return to InstaRefund by fax or on a disk by mail. If you want your money as soon as possible — say, within three to five days —

InstaRefund offers a Refund Anticipation Loan of up to \$3,000 at a cost of \$69.95, which includes the basic InstaRefund fee.

Conclusion

SoftView plans to release MacIn-Tax in two phases, and by the time you read this, only the first phase may be available. The second phase will add some less frequently used forms to the package. In late 1990, SoftView hopes to add a modem service to InstaRefund.

Next year's packages will probably include state forms for businesses and direct links to software for personal-finance management so you can keep up-to-date versions of your tax returns all year long. It's too soon to say which, if any, of the tax-software publishers will be involved, though.

A future player in the tax-software game may be Datax of Moline, Illinois. Datax recently acquired EZWare, which has offered Excel tax templates for both the Mac and the PC. Datax plans to enter the Mac market with three products — Tax-Magic, Tax-Magic Plus, and Tax-Magic Pro. These are totally new packages, not updates of the EZWare templates, and were not available for review at press time.

This is Scott Beamer's fifth year of writing about preparing tax returns with a Mac. You would think by now he'd have found something more interesting to write about. He is also on the BMUG (Berkeley Macintosh User Group) board of directors.

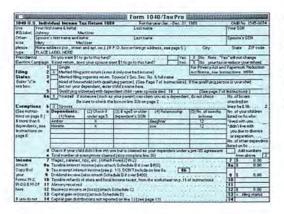


Figure 4: This fairly good representation of the IRS 1040, taken from Chesapeake Software's Tax Pro, is typical of Excel-template tax packages.

Forms	Schedules	Worksheets	Statements
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1040 Ge	B: Interest	1040/21: Social	B: Interest Income
2441: C	C's: Busines	1040/24 & 25:1	B: Dividend Income
3903: N	D: Capital G	1040/26: Health	Miscellaneous Statement
4255: R	D-1: Continu	1040/33b: Depe	1040/22: Other Income
4684: C	E's: Supplen	1040/58: Earned	Income Credit
4797: 0	F's: Farm In	A/11812: Interes	st Deduction
4868: A	R: Elderly or	R/20, 21 & 25: M	isc. Deductions
4952: 11	Short Sched	Form 2441 Adjus	tments
8283: N	Short Sched	Form 3903 Works	sheet
8453: E	Long Sched	Schedule SE Adju	stments
8814: C	Long Sched	Status Summary	- Company of the Comp
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RAL App	lication		

Figure 5: MacInTax offers complete menus of forms, schedules, and worksheets. Also available but not shown are forms 1040EZ and 1040A. Heizer's Personal Tax Templates and compuCRAFT's Bottomline have many of the same forms.

The Bottom Line

For those people who don't have Excel, MacInTax is the obvious choice. This is one of the most universally respected packages for the Mac and is a frequent award winner. SoftView lowered the price this year, and now MacInTax costs little more than the competition, particularly since it is available at a discount from most retail stores.

Users of Microsoft Excel or Works may prefer a cheap and customizable template package. The 1989 Personal Tax Templates from Heizer Software are perennial favorites, offering the most forms for the lowest price. Demo disks, phone tech support, and several related templates are available.

Bottomline Personal Edition is the only template package this year to take advantage of Excel 2.2's new features, so those without the latest version of Excel will have to get their templates elsewhere.

For the lowest price in tax templates, you can't beat **TaxSmith**. In fact, Island Computer's Quick and Family packages are the two lowest-priced templates available for the Mac. The Full and Pro packages don't offer as many forms for the same price as the competition does, though.

Based on the number of forms offered, **Tax Pro** is clearly overpriced. Other programs offer twice as many forms for less money.

Report Cards

Bottomline Personal Edition \$\ddots\$

This package offers templates for many IRS forms, including business, estate, and 1040A short forms. Requires Mac Plus or later, Excel 2.2, and System 6.02 or later.

Pros: Excel 2.2 compatibility lets Bottomline take advantage of superior graphics capability to produce sharp IRS forms.

Cons: Does not work with earlier versions of Excel.

List Price: \$49.95

compuCRAFT, 9034 Arrow Grass Way, Highlands Ranch, CO 80126; (303) 791-2077.

MacInTax Federal 1989

Containing practically all the forms most people need, as well as worksheets, special tools, and the complete 1040 instruction booklet, MacInTax keeps track of which forms have all necessary lines filled in and which still need work. An Itemization window lets users fill in supporting documentation for the IRS. Requires Mac 512KE or later, two floppy-disk drives, and System 4.2 or later.

Pros: Clear and crisp IRS forms, both onscreen and printed. Has eight state forms, which can link to the federal form. Manual is more complete than those of other packages. SoftView provides an electronic filing service, InstaRefund, for those expecting refunds.

Cons: InstaRefund accepts returns only by fax or mail-in disk, although a modem service is expected in time for next year's returns.

List Price: \$99

SoftView, Inc., 4820 Adohr Lane, Suite F, Camarillo, CA 93010; (805) 385-5000.

1989 Personal Tax Templates ####1/2

The package contains 35 forms with a worksheet for calculating depreciation and a check register for record summary. Most of the templates are compatible with Microsoft Works. Requires Mac 512KE or later and System 3.2 and Finder 5.3 or later.

Pros: Excellent value for the price. Demo disk available for \$2. Phone technical support available.

Cons: Has skimpy documentation. Does not have the range of state forms that MacInTax does.

List Price: \$35

Heizer Software, 1941 Oak Park Blvd., Suite 30, Pleasant Hill, CA 94523; (800) 888-7667.

Tax Pro 1989

This package comes with Excel 1.5 templates for 13 IRS forms and some worksheets. Requires Mac 512K or later and System 2.0 and Finder 4.1 or later.

Pros: Those with relatively simple returns may find Tax Pro provides all the forms they need.

Cons: Has fewer forms than other packages and offers no state forms. Other packages offer more forms for the same money or less.

List Price: \$49.95

Chesapeake Software, 303 Seventh St. N.E., Washington, DC 20002; (202) 546-9479.

TaxSmith Full

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The Full package includes 17 forms.
Family and Quick versions have fewer forms. Excel 2.2 version requires Mac Plus or later and System 6.02 or later; Excel 1.5 version requires Mac 512KE or later and System 3.2 or later.

Pros: Available as Excel 2.2 or 1.5 templates.

Cons: Has fewer forms than other packages and offers no state forms.

List Price: \$50

Island Computer Services, 3501 E. Yacht Drive, Long Beach, NC 28465; (800) 826-7146.







Most Valuable Players

Want the world on your desktop?
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NEO ODEN

first saw one on a "Star Trek" episode: a shiny, rugged, coastersized disc that contained vast quantities of information. Fifteen years later, I was at a computer show looking at an entire encyclopedia on an equally small, nearly indestructible disc. The disc was a CD-ROM (compact disc—read-only memory), the computer cousin of the familiar audio compact disc.

Like audio CDs, these discs are read by a laser-equipped player, known in the computer world as a CD-ROM drive. A CD-ROM disc (optical) is not used for personal data storage as is a hard disk (magnetic). CD-ROM involves a read-only technology. You can't write anything onto a CD-ROM disc, nor can you change what's imprinted on it. A disc is like a book: You buy it, and you read it—you don't change it.

CD-ROM's strong suit is its extraordinary capacity. A single disc can contain up to 650 megabytes of text, sound, and graphics. Current data-compression schemes can squeeze more than 250,000 pages of text onto one easily transportable disc. Despite this potential, until

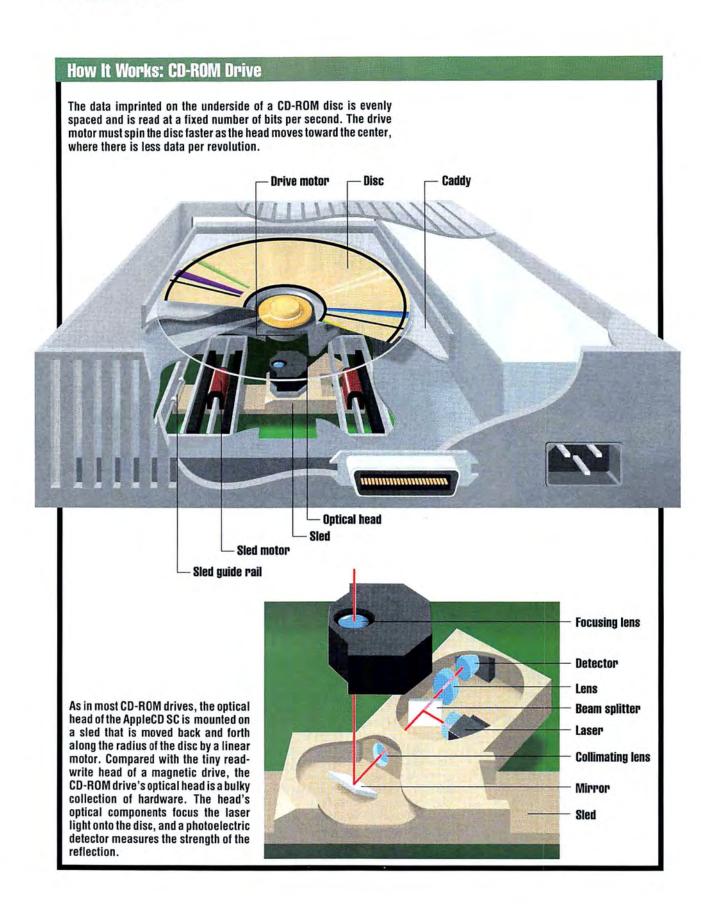
recently CD-ROMs have been as accessible to Mac users as the disc Spock used.

Until early last year, CD-ROM was a "chicken or egg, which comes first?" standoff between drive manufacturers and disc publishers. The problem isn't hardware—the technology is rock solid. CD-ROM drives and audio CD players use similar optical mechanisms. In fact, a CD-ROM drive is essentially an audio CD player with a computer interface tacked on. Mac-compatible hardware has been available since 1988, when Apple introduced its CD-ROM drive, the AppleCD SC. And Apple wasn't a reckless pioneer—CD-ROM drives had debuted three years earlier in the PC market.

Although the hardware has been available for a while, only recently have enough general-interest discs become available to make buying a drive worthwhile. But don't blame the software publishers. There haven't been enough drives on users' desks to make publishing Mac CD-ROMs worthwhile. Around 3 million Macs have been shipped, but fewer than 20,000 are attached to a CD-ROM drive. Last year, however, the Mac CD-ROM drought finally began showing signs

By John Rizzo and the MacUser Labs staff

CD-ROM Drives





of abating. Publishers took a risk and began releasing discs that combine CD-ROM's enormous size with the Mac's unique graphics and sound capabilities. Interest shot up throughout the industry. If predictions by such boosters as the Optical Publishing Association are anywhere near correct, the current trickle of Mac CD-ROM discs could become a flood in the '90s. (Look for a roundup of the best discs in next month's issue.)

New drives have also appeared. Until recently, you had only one choice — Apple's. The lack of competition kept prices high and innovation low. Now, however, new drives have arrived to challenge Apple's monopoly. These units have attractive prices (as low as \$895) and innovative features that make them worthy competitors. When we began testing, there were five challengers: the CD Technology Porta-Drive, Denon DRD-253, NEC CDR-77, OMI ProCDP, and Toshiba XM-3201 A1 MAC.

MacUser Labs ran a suite of real-world

and specialized technical tests to see how the five newcomers stand up against the AppleCD SC. We measured how each drive behaved during normal use by launching a CD-ROM-based application, opening files, and copying files from the CD-ROM onto a hard disk. We then thrashed each drive for a few hours with sophisticated test equipment to discover the reasons behind their real-world performance. We also ran preliminary tests on two beta products, the NEC CDR-35 portable and the Optical Access CM 231 (see the "On the Horizon" sidebar). Our conclusion: Competition has indeed created better drives and increased the value of your CD-ROM dollar - although some drives have taken a step or two backward from Apple's.

But we also learned that if CD-ROM technology is to reach even half the potential its boosters claim, any new disc that enters the market must be attractive enough to make users forget CD-ROM's most annoying attribute: its slowness.

The Great Distributor

All CD-ROM drives are slow (see Figure 1). And we mean s-l-o-w. Or, better yet, s—1—o—w. In fact, our tests show that in most cases, CD-ROM drives are even slower than floppy-disk drives. And because of inherent limitations in CD-ROM standards, they're not going to get much faster.

CD-ROM is a locked technology, frozen in place by aging standards. By defining such elements as disc capacity and data-transfer rate, the Sony-Philips Red Book, developed in the late '70s, defined the performance limits of audio CDs. The Yellow Book upgrade, which appeared in the early '80s, extended these limits to CD-ROM. Any manufacturer could ignore these standards and create a faster optical-disc system that held more data. The new technology might be better, but it wouldn't be CD-ROM. It's risky business to establish a new standard - especially when the existing one is well accepted and full of promise.

On the Horizon

The Mac CD-ROM market is expanding rapidly. Since we began testing, several interesting new drives have appeared. For example, NEC is now shipping a CD-ROM drive that doubles as a stand-alone audio CD player. The NEC CDR-35 (\$698) detaches from its SCSI-

interface dock and becomes a self-contained audio CD player with a display for the track number and controls for moving between tracks. The CDR-35 can run on an optional S79 battery pack or on the included power supply.

The drive fits in the Mac Portable case, weighing in at three pounds with the battery pack. Taking a cue from the power-management system of the Portable, the CDR-35 stops spinning after five minutes of inactivity to prolong battery life; any access request brings it back up to speed again. Our experience with the drive is that it is slower than most, but its versatility and low price make it an attractive choice. NEC Technologies USA, 1255 Michael Drive, Wood Dale, IL 60191; (800) 366-3632 or (312) 860-9500.

Procom Technology has released a lowcost CD-ROM drive, the HiPerformance

(\$799). Lucky buyers of early models are assured a Toshiba mechanism at a very good price, but Procom won't guarantee that this mechanism will remain its innards of choice. Procom Technology, 200 McCormick Ave., Costa Mesa, CA 92626; (714) 549-9449.

Another new drive, the CM 231 (\$1,130) from Optical Access International, contains an LMSI mechanism in a zero-footprint case that fits under any compact Mac. Instead of a linear head configuration (see the "How It Works" sidebar), this drive employs the radialarm mechanism often used in hard drives. Its average access time is fast as CD-ROM drives go, and the beta unit we saw worked very

well. Optical Access International (formerly Massachusetts Micro Data Systems), 36 Commerce Way, Woburn, MA 01801; (800) 523-2679 or (617) 935-2679.

This spring, Pioneer is expected to ship the DRM-Minichanger, a CD-ROM drive that makes six discs available at once. The discs are placed into a plastic frame, which is inserted into a magazine that pops into the front of the drive. All six discs can then be accessed without the need to remove and reinsert. The drive should sell for around \$1,295. Pioneer Communications of America, Sherbrooke Plaza, 600 E. Crescent Ave., Upper Saddle River, NJ 07458; (201) 327-6400.

One enormous step above the Minichanger is the Kubik CDM 240, an OEM jukebox device that holds 240 discs that's more than 150 gigabytes (billions of bytes) of on-line storage. Discs are placed

in a carousel that surrounds a CD-ROM drive. At 17 x 16.5 x 6.5 inches, the CDM 240 is surprisingly small for the number of discs it holds. The unit did not have a retail outlet at press time, but Kubik will assemble customized systems for about \$13,500 for a single unit or \$5,000 a unit for quantities of 100 or more. Kubik, 18873 Allendale Ave., Saratoga, CA 95070; (408) 867-7969.



The NEC CDR-35 leads a dual life. In addition to serving as a CD-ROM drive, the drive mechanism can be separated from the SCSI dock and metamorphose into a portable, compact audio-disc player.

CD-ROM Drives

Despite its limitations, CD-ROM serves a purpose not met by any other mass-storage device. The name of the game is distribution. Like audio CDs, CD-ROMs can deliver huge amounts of information in a compact form — but that's where the similarity ends. Audio CDs are limited to music, but CD-ROMs can deliver clip art, encyclopedias, interactive multimedia presentations, the complete works of Shakespeare, and music. Anything your Mac can display or play can be distributed cheaply and reliably.

Publishers can also use the massive capacity of CD-ROMs to increase the value of their products. Microsoft, for example, uses less than 1 percent of its Microsoft Office disc to distribute Excel, PowerPoint, Mail, and Word. It then fills the next 15 percent of the disk with a manual for each of these applications, an extensive tutorial, a HyperCard-based help system, 383 screen fonts from Adobe, clip art from Genigraphics, and two dozen other third-party applications and utilities. All this extra software comes on one disc, with plenty of room to spare — enough for 200,000 pages of text.

Although it makes sense to leave the manuals on the Microsoft Office disc, you'd want to download the applications and utilities onto your hard-disk drive, because a CD-ROM is just too slow for acceptable performance. In fact, if CD-ROMs catch on in a big way, one of the beneficiaries will be manufacturers of large hard disks. Enormous multimedia presentations, for example, as well as scientific simulations and interactive training applications, can be distributed safely and inexpensively on cheap, durable CD-ROMs - but the software will need large hard disks to perform at its best. And if an interactive training course requires students to enter information, CD-ROM's read-only nature makes a hard disk a necessity.

Major corporations (as well as the U.S. government) are exploring CD-ROM technology as a way of distributing information to employees across the country or around the world. Corporations can create their own CD-ROMs for about \$30 per disc — or less than 5 cents per megabyte. At \$2.50 per megabyte, floppies just can't compete. Even cartridges for tape drives, the only mass-storage media slower than CD-ROMs, cost about 25 cents per megabyte when full. CD-ROM costs are getting even lower as production equipment drops in price and more

Capsule Reviews

AppleCD SC

This is the drive that started it all for Mac CD-ROM. Though expensive, it's well built and offers good — but not great — speed. Audio features include RCA stereo jacks; a convenient thumbwheel volume control; and CD Remote, the best audio-control software.

Pros: Pushpin SCSI identification. Automatic adjustment to U.S. or European power. Excellent audio software.

Cons: Expensive. 90-day warranty. No AC fuse.



Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 (408) 996-1010 \$1,199

CD Technology Porta-Drive

tttt1/2

At the Porta-Drive's heart is a Toshiba 3201-B mechanism, the fastest available for the Mac. Its separate power supply can be placed on the floor or replaced by an optional four-pound battery pack. Until June 1990, this compact package is an unbeatable value because CD Technology is offering Microsoft Office and Image Club's LetterPress Type-Vendor for only \$300 extra.

Pros: Tied for fastest performance. Least expensive, smallest, and lightest. Can be set for either U.S. or European power. Battery-pack option.

Cons: No preamp audio output.

Three-position volume control. No power indicator or AC fuse. No audio software.



CD Technology 780 Montague Expressway, Suite 407 San Jose, CA 95131 (408) 432-8698 \$895

Denon DRD-253

The ponderous performance of this drive lags far behind that of most of the other drives. The built-in speaker is good for working with audio, but its presence doesn't explain the box's large size. You can operate it as a stand-alone audio CD player, but only after you disconnect it from the Mac

Pros: Internal speaker. Preamp and headphone audio output. Access and power indicators. Internal AC fuse.

and set a bank of DIP switches.

Cons: Very slow. Only one 50pin SCSI connector. Internal SCSI termination. No audio software.



Denon America 222 New Road Parsippany, NJ 07054 (201) 575-7810 \$990



NEC CDR-77

This sluggish drive is far behind the mainstream in speed. Its CD caddy is not compatible with those of the other drives reviewed. Although the CDR-77 includes software that allows the Mac to control audio functions, the Mac can't be used for anything else during play.

Pros: Audio software (though limited). Internal AC fuse.

Cons: Very slow. Essential Macinterface kit is an expensive



NEC Technologies USA 1255 Michael Drive Wood Dale, IL 60191 (800) 366-3632 or (312) 860-9500 Drive, \$999 SCSI Interface Kit, \$199

OMI ProCDP

"option."

Not for average users, this 19-inch rack-mountable drive features professional audio-output jacks for use in studio environments. It's relatively fast and extremely well built. Headphone and stereo outputs are provided by quarterinch phone jacks. An enhanced model, the Combo ProCDP (\$2,495), comes with a built-in RS-422 interface to control musical keyboard functions. An upgrade to the Combo unit is available for \$695.

Pros: Very good overall speed. Professional audio outputs. Automatic adjustment to U.S. or European power. External AC fuse.

Cons: Slow access times. Most expensive, largest, and heaviest. No audio software.



Optical Media International 485 Alberto Way Los Gatos, CA 95032 (800) 347-2664 or (408) 395-4332 \$1,488

Toshiba XM-3201 A1 MAC

Toshiba is the name of the game in CD-ROM performance right now. This very solidly built unit uses the same mechanism as does the CD Technology Porta-Drive but incorporates its power supply into a slightly larger case.

Pros: Tied for fastest performance. Automatic adjustment to U.S. or European power. Compact. Internal AC fuse.

Cons: No preamp audio output. Three-position volume control. No power indicator. No audio software.



Toshiba Information Systems 9740 Irvine Blvd. Irvine, CA 92718 (800) 456-3475 or (714) 583-3000 8970

service companies compete for the corporate CD-ROM-production dollar. If CD-ROM gains widespread acceptance, large production runs could drop the perdisc cost to less than \$2.

Companies can save reams of paper—and piles of money—by using CD-ROMs to replace training and operating manuals. For example, the amount of paper saved by one text-only CD-ROM could easily weigh a ton and a half—and cost well over \$4,000 to mail. Armed with a Mac Portable and a CD Technology Porta-Drive with optional battery pack, technicians could lug every repair manual they'd ever need right to the job site.

CD-ROM is also an inexpensive alternative to wide-area networks and satellite links. An MIS director can drop a CD-ROM into an envelope and mail a 650-megabyte corporate database for 70 cents. Compare that to transmitting the same data by modem — it would take 23 days at 2,400 bits per second. And because the read-only, nonmagnetic character of CD-ROM ensures a fairly permanent, tamperproof medium, CD-ROM is also ideal for archiving information.

Getting Started

For many users, poky performance is a fair trade-off for the immense capacity of this rugged, inexpensive medium. If you or your company agree, CD-ROM is for you. As you make your choice among the drives that we tested, you'll be happy to know that all of them are a snap to hook up and use. Five of the six manufacturers are also kind enough to supply all the appropriate cables; NEC charges an additional \$199 for its SCSI Interface Kit, which contains a SCSI cable and essential software.

All the CD-ROM drives are SCSI devices and require attention to two SCSI issues: identification and termination. The SCSI protocol lets you daisy-chain up to seven devices, each with a unique identification number from 0 to 6. All but one of the drives use DIP (dual in-line package) switches to change the preset ID. The lone exception, the pioneering AppleCD SC, makes the chore easier with a pushpin selector that displays the ID number rather than requiring you to interpret the brain-boggling binary DIP-switch positions.

After setting the appropriate SCSI ID, you must make sure that the first and last devices on your SCSI chain are properly

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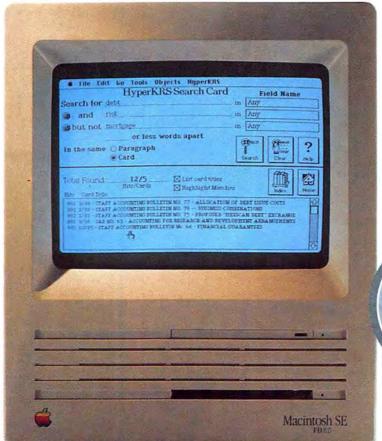
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CD-ROM Drives



terminated. This dull but important responsibility ensures that all electrical signals fall within an appropriate voltage range. On five of our CD-ROM drives, you accomplish termination by inserting a supplied plug into the drive's second SCSI connector. The Denon DRD-253. however, doesn't have a second SCSI connector. This omission forces you to place the DRD-253 at the end of your SCSI daisy chain or spend a few bucks on a special T-connector.

Each drive also includes software that you must place in your System Folder before the Mac can recognize the discs you insert. After you restart the Mac, you'll notice that no icon appears. Don't worry; nothing's wrong. As with a floppy drive, you must insert a disc (or in the case of a floppy, a disk) before anything shows up on the desktop.

Only one manufacturer, CD Technology, offers CD-ROMs with its drive, From January through June of this year, an extra \$300 gets you both Microsoft Office (list \$949) and a 240-megabyte collection of fonts and clip art from Image Club (list \$199). The latter disc, Letter-Press Type Vendor, contains a PostScript starter set of 10 fonts and 145 images. Your credit card and a phone call to Image Club can unlock 613 more fonts (\$25 each) and 2,200 images (in 15 volumes at \$99 each).

Whatever CD-ROM drive you select, make sure that the CD-ROM discs you buy can be recognized by the Mac. Sad to say, most still can't be.

Double-Duty Discs

CD-ROMs come in two flavors: PC and Mac. About one-tenth of all personal computers are Macs, and a similar fraction of all CD-ROM discs can be read only by Macs. Mac-only discs, such as those with a HyperCard interface, use Apple's HFS (Hierarchical File System) to tell the System the location of each file on the disc. Discs designed for MS-DOS can be read by a Mac only if you use a software MS-DOS emulator such as SoftPC or a hardware add-on such as Mac286 from Orange Micro.

Fortunately, two CD-ROM standards have emerged that let Macs and PCs recognize files from the same discs. However, just recognizing a file - even reading it onto a hard disk - doesn't mean that you can actually use it. An application must exist - either on the CD-ROM or on a hard-disk drive - that

gives your Mac access to the information in the file. And until more CD-ROM drives infiltrate the Mac world, disc publishers aren't going to spend much time developing Mac interfaces for their discs. Again, the chicken or the egg

In any case, new standards make double-duty discs possible and some adventurous publishers are taking advantage of them. The first standard is High Sierra, named for a hotel in the California ski country north of Lake Tahoe where the standardization meetings were held. The second standard, ISO 9660, is a slightly modified version of High Sierra that was established by the International Standards Organization. Both standards benefit developers, who now need to produce only one disc for Macs and PCs. Each disc contains two interface applications, one for each computer, and both computers are smart enough to know which application to use. Users on both sides of the blue line benefit because more discs can be made available to all.

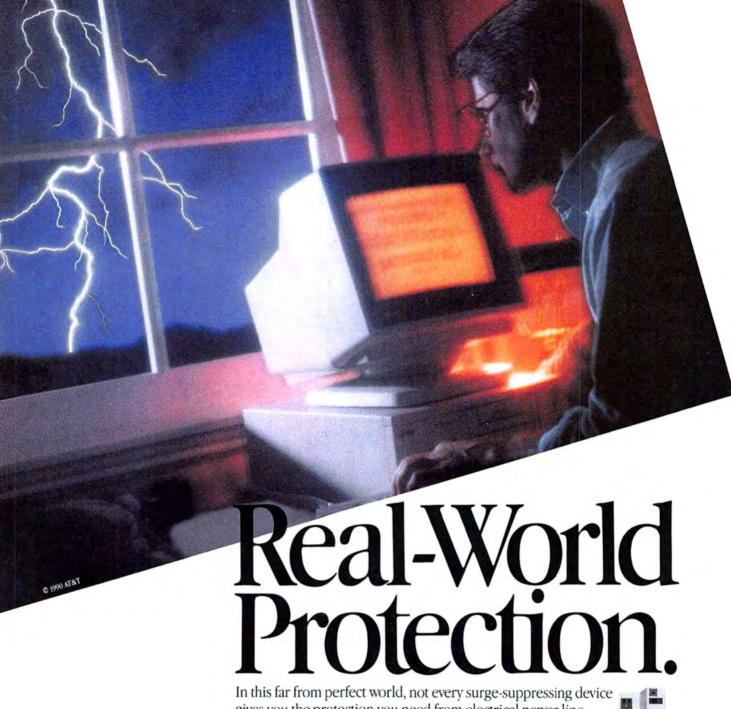
To enable your Mac to read High Sierra or ISO 9660 discs, you simply drop a set of files called High Sierra Access, ISO 9660 Access, and Foreign File Access into the System Folder (Foreign File Access determines whether the disc is High Sierra or ISO 9660). All three files were written by Apple and are supplied free with five of the drives we tested. NEC includes the access files in its \$199 SCSI Interface Kit. If you use discs designed solely for the Mac, you don't need the access files. An HFS-encoded CD-ROM looks just like an enormous floppy disk to the Mac.

A Snail's Race

After you have inserted your first disc into the protective caddy supplied with each drive and slipped the caddy into your new CD-ROM drive, it's time to experience for yourself what we've warned you about all along: CD-ROM drives are slow. Because they are so slow, performance is even more of a buying consideration than it is for a relatively fast device such as a hard drive. A fast hard drive can save you seconds of time, but a fast CD-ROM drive can save you minutes.

Although there are fairly large performance differences among drives from different manufacturers, there's a maximum limit to a CD-ROM drive's datatransfer speed. The culprit is the hardware standard that Philips and Sony agreed

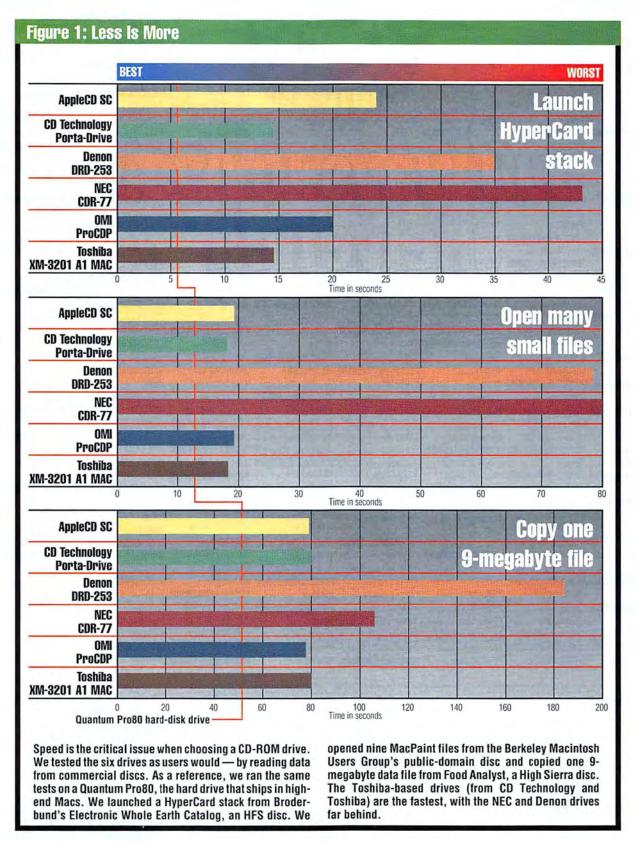


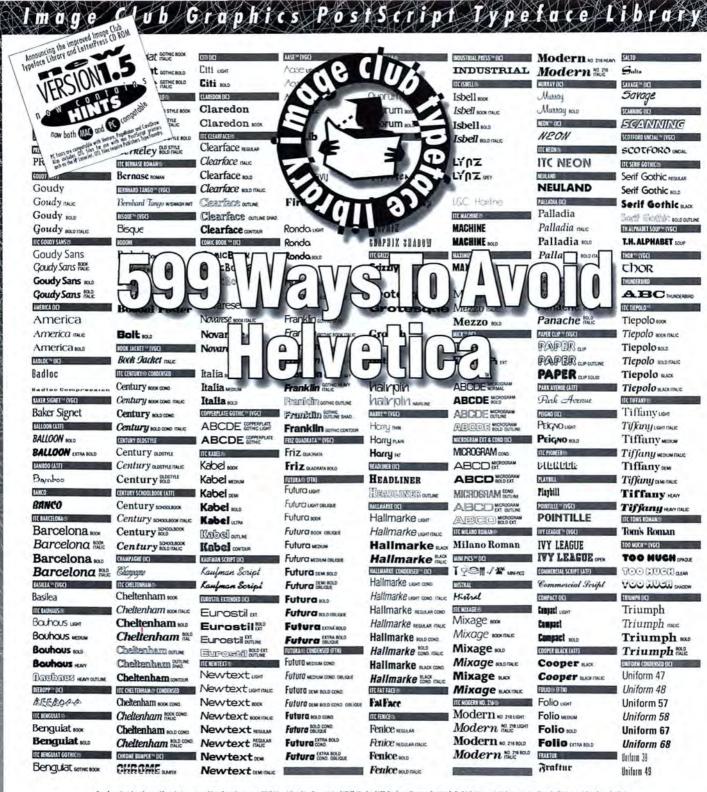


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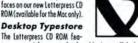


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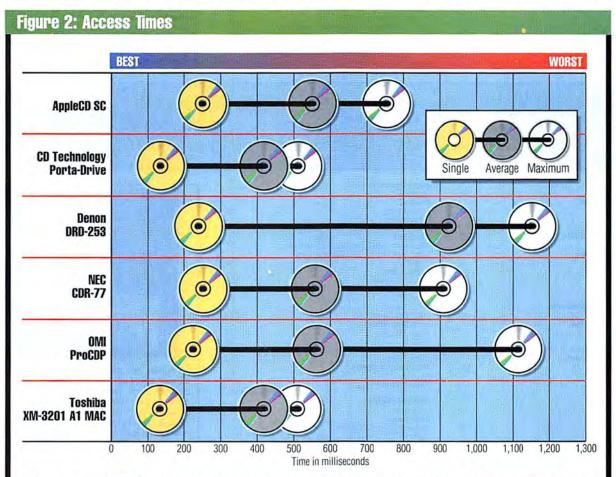


on when they first developed audio CD technology back in the '70s. Remember, CD-ROM is an offshoot of audio CD, a technology that doesn't need swift access times or high throughput rates. An audio CD player rarely needs to reposition its bulky laser-equipped optical read head, and audio requirements are easily satisfied by the CD throughput standard of 153K per second. As long as CD-ROM rides audio CD's coattails, it will remain slow — but benefits such as compatibility and low disc cost because of shared manufacturing plants make sluggish performance a bit more tolerable.

Right now, the best way to achieve acceptable CD-ROM speed is to buy the right drive. To help you choose, we ran a suite of real-world tests on each of our six candidates. To provide a reference point, we also ran the same tests on the Quantum Pro80, the hard drive that Apple puts into its high-end Macs. To see how quickly each drive launches an application that uses a large data file, we opened a Hyper-Card stack from Broderbund's Electronic Whole Earth Catalog CD-ROM. Because the system overhead required to open multiple files slows any type of drive, we opened a group of MacPaint files from the Berkeley Macintosh Users Group's PD-ROM. And finally, to test raw throughput, we copied a 9-megabyte file from a High Sierra disc called Food Analyst onto a fast hard disk.

The CD Technology and Toshiba drives, both of which are based on a Toshiba 3201-B mechanism, won the race, followed closely by the OMI drive (see Figure 1). Apple's drive follows OMI's, and then there's a longer wait for Denon's and NEC's. These last two drives showed similarly poor performance in the HyperCard and MacPaint tests, but when copying the 9-megabyte file, Denon's limped in a distant last.

To uncover the reasons behind these wide differences in performance, we tested the inner workings of each drive. Using sophisticated test software called SCSI Bench and a comprehensive test disc from Sony, we ran each drive through an exhaustive set of gymnastics. We wanted to determine how quickly each optical head could get to the data it wanted (access time) and — once it got there — how quickly the data could be sent back



Access time is the deciding factor in a CD-ROM drive's performance. The quicker a drive's optical head can get to the data, the faster you can get on with your work. We measured each drive's access time in three tests. The maximum test was a worst-case challenge, with data

alternately placed on the rim and center of the disc. The average test used data scattered randomly over the disc, accurately measuring real-world performance. Finally, the single test showed how quickly the head could dash to one spot. Again, the Toshiba-based drives led the pack.



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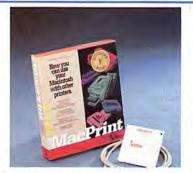


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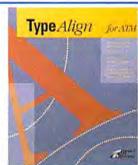
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CD-ROM Drives



to the Mac (throughput).

Access time turned out to be the deciding factor in a drive's performance (see Figure 2). The Toshiba-based drives showed the fastest access times as well as the best overall real-world performance. Denon's DRD-253 had the slowest average access time, much greater than the maximum time for most drives. The OMI ProCDP's times were surprisingly slow, considering how well it did in our real-world tests.

Throughput cannot be increased beyond 153K per second, the limit set by the Sony-Philips Red Book standard. Most drives achieved this rate, though Apple's and NEC's lagged a bit behind. Denon's again pulled in last: Its throughput chugged along at only 86K per second.

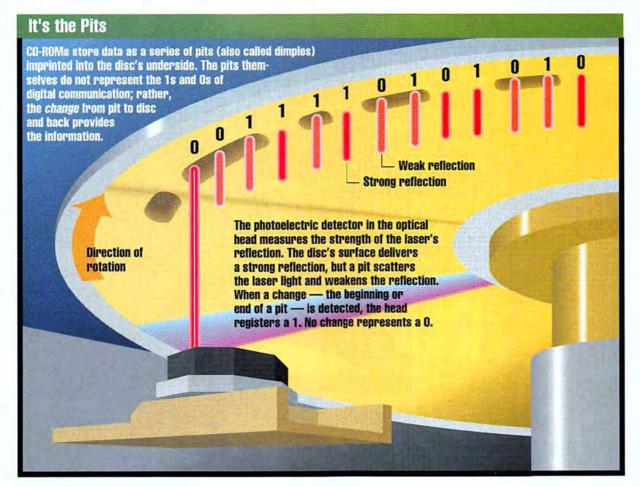
Slow Perfection

If a manufacturer decided to embark on a quest for the perfect CD-ROM drive — while still obeying the Red and Yellow Book standards — what's the best performance it could expect? If access time could be shrunk to zero, the drive would always operate at its maximum throughput rate — about 9.2 megabytes per minute. This hypothetical CD-ROM drive would be more than twice as fast as the fastest tape drives, which rumble along at 3.6 megabytes per minute. No CD-ROM drive will ever be a threat to the hard-drive industry, however. The Quantum Pro80 packed into each high-end Mac, for example, can reach speeds of more than 50 megabytes per minute. Even the perfect CD-ROM would be left floundering in its wake.

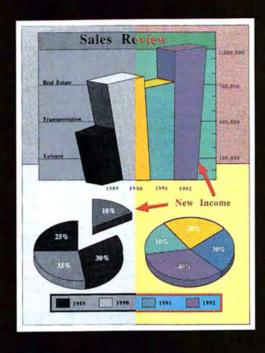
To approach the ideal CD-ROM speed, several things could be done. First, a manufacturer could improve access time by speeding up the rate at which the optical head moved back and forth while searching for a particular block of data (see the "How It Works" sidebar). Unlike a tiny hard-drive head, however, an optical head is a bulky device containing a semiconductor laser, a lens, a prism, and

assorted electronics. The heavier the head, the more energy it takes to control it. Toshiba's drive overcomes the head's mass (and achieves its quick access time) by delivering more push-pull power — a bit like putting a bigger engine into your old Camaro. The same rapid access also could be achieved by decreasing the mass of the optical head — and someday a CD-ROM-drive designer should do both.

Another area for improvement is in the motor that spins the disc. Information is encoded on both audio CDs and CD-ROMs in a three-mile-long spiral of evenly spaced, infinitesimal pits (see the "It's the Pits" sidebar). To keep data flowing into the Mac at the proper rate, this spiral must pass under the read head at a constant speed. And because the outside of a rotating disc moves faster than the inside (remember the playground merry-go-round you rode as a child?), the disc must spin faster as the head moves toward the center and slower as the head moves outward. An improvement in the



How the other half lives.



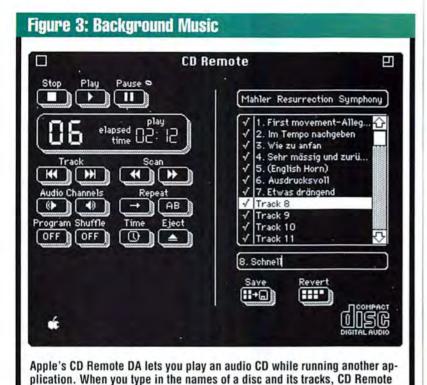
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With its 32-bit QuickDraw Chooser-level driver, the QD5500 gives you 300dpi text in any size or orientation. Best of all, your documents will be compatible with the LaserWriter's Page Setup command so there's no need

for repagination when using both a QD5500 and a LaserWriter.







creates a System Folder document that remembers your entries. Each time

you use the same disc, CD Remote lets you select and play tracks by title.

drive's ability to change speeds rapidly, coupled with quicker access times, would help approach the CD-ROM ideal.

The Sound of Music

The standardization that keeps CD-ROM slow also ensures that all CD-ROM drives can play audio CDs, which is handy for multimedia developers, music studios, and people who like to play music while they work. (We used a CD of the London Symphony playing Mahler's Second for our highly subjective test of each drive's audio capabilities.) But before you start stacking audio discs next to your Mac, there's a slight catch.

Five of the six drives must be controlled by a Mac to function as audio CD players. Only the Denon DRD-253 can be used as a stand-alone player and that only after you've disconnected it from the Mac and reset a bank of DIP switches. Of the five that require Mac connection, only two — the AppleCD SC and NEC CDR-77 — provide the required software. The other drive manufacturers recommend that you cajole your Apple dealer into giving you a copy of CD Remote, Apple's audio software. And

even if you can score a copy, there's no guarantee that the other drives will use all its features correctly.

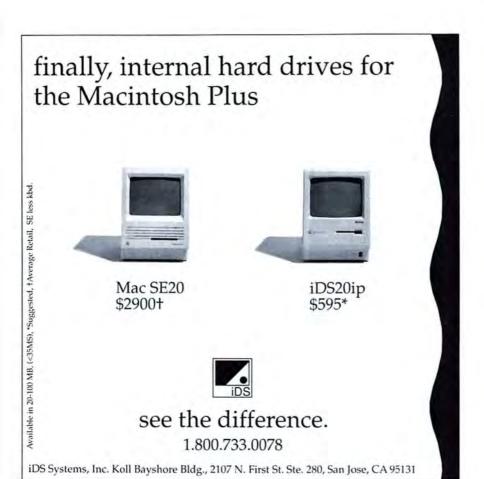
CD Remote is a clever DA that looks and acts like a remote-control device for an audio CD player (see Figure 3). If you type in the disc's name and track titles and save your list when you close the DA, it will create a file that remembers what you entered. The next time you insert the disc, CD Remote will display the titles and let you select what you wish to hear.

NEC's less attractive audio controller, Music Box, is not a DA and lacks the track-labeling ability of Apple's CD Remote. NEC also supplies two utilities, NecCdPlay and NecCdStop, that start and stop audio play. Unfortunately, none of the NEC programs can run in the background, even under MultiFinder, while you're using your Mac. Essentially, your Mac becomes the world's most expensive CD player.

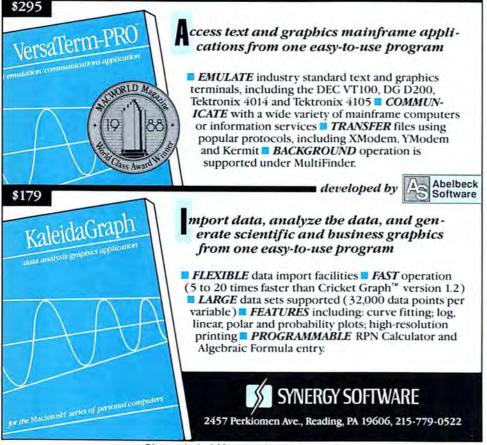
The best drive for music is OMI's ProCDP. This 19-inch rack-mountable model is aimed at the professional music studio or CD-ROM developer's lab and has quarter-inch stereo and headphone jacks. (If you're really serious about audio



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CD-ROM Drives

CD, check out OMI's stand-alone professional model, the Combo ProCDP for \$2,495. It has built-in audio-control hardware and an RS-422 keyboard interface.)

The Denon DRD-253 is the only drive with a built-in speaker. Granted, its tinny monaural sound won't win any hi-fi awards (it makes the London Symphony sound as though it's playing kazoos), but it is handy to hear the audio without headphones when you're designing multimedia presentations.

Most of the other drives have a pair of RCA jacks for preamp stereo output and an eighth-inch miniheadphone jack on the front. Unfortunately, the fast, inexpensive Toshiba-based drives (Toshiba XM-3201 A1 MAC and CD Technology Porta-Drive) are the least suited for audio. They have no stereo jacks to connect to an amplifier, only a miniheadphone jack. In addition, the volume control on both models is a crude slide switch with three positions (soft, not-as-soft, and kind-of-loud).

If you own an audio CD player, you'll be aware of one major difference between it and a CD-ROM drive: price. If the hardware is essentially the same, why are CD-ROM drives so much more expensive? CD-ROM drives do have a few things audio CD units don't, such as a SCSI interface and the error-correction circuitry essential for flawless performance. No one except a sound engineer is going to complain if one oboe drops out for a millisecond in Mahler's Second, but a misread bit in a database could have a negative effect on your career. The main reason for the price difference is simple: sales volume. The consumer-electronics industry can sell far more audio CD players in one year than the total number of Macs sold to date.

Conclusion

The past year saw two important developments for Mac CD-ROM. The first high-quality discs were released that show the technology's true promise, and new drives appeared that are giving the AppleCD SC a run for its money. This competition has spurred innovation and lowered prices. Competition has also caused an increase in performance, but there are absolute limits that can't be overcome as long as CD-ROM shares hardware standards with audio CD. Speed will improve in the next few years, but it will never approach that of hard drives or nonstandardized optical media.

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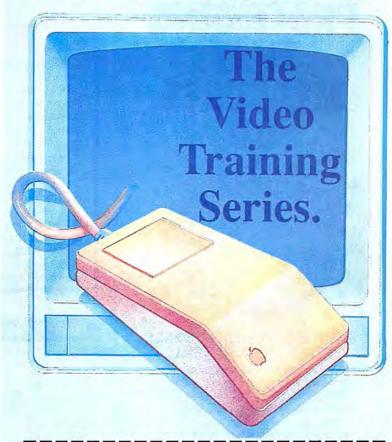
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CD-ROM Drives



The Bottom Line

Not that long ago, an 8-inch floppy disk held 128K. Today 650 megabytes (thousands of kilobytes) of text, sound, and graphics fit snugly on a rugged 4.75-inch CD-ROM disc. One thing hasn't changed, however: CD-ROM drives are as slow as floppy-disk drives.

Performance is the top priority when choosing a CD-ROM drive. A slow CD-ROM drive can result in delays measured not in fractions of seconds but in fractions of minutes. To cut down the wait, we recommend that you choose one of the two drives that use the Toshiba 3201-B mechanism, the fastest on the market.

Our favorite is CD Technology's Porta-Drive (\$895), a small unit that comes with



a separate power supply or optional battery pack. Its performance is essentially equal to the other Toshiba-based drive, Toshiba's own XM-3201 A1 MAC (\$970), but the

Porta-Drive is our best-buy recommendation. It's less expensive, it's portable, and CD Technology has a January-to-June offer of Microsoft Office and Image Club's LetterPress TypeVendor for an additional charge of only \$300. Even after this offer expires, the Porta-Drive will still be compact, fast, and versatile.

Table 1: Features of CD-ROM Drives

	AppleCD SC	CD Technology Porta-Drive
List price	\$1,199	\$895
OEM mechanism	Sony CDU 8001	Toshiba 3201-B
Drive orientation	horizontal	horizontal or vertical
Warranty	90 days	1 year
Audio		
Preamp output	RCA phone jacks	none
Headphone output	1/8-in. miniphone jack	1/8-in. miniphone jack
Volume control	thumb wheel	three-position switch
Internal speaker	no	no
Software	CD Remote	none
SCSI		
Connectors	two 50-pin	two 50-pin
Termination	plug	plug
Identification	pushpin	DIP switch
Power		
Supply	internal	external
Switch	rear	power supply
Battery-pack option	no	yes, \$200
Auto-configure (110/220 volts, 60/50 Hz)	yes	no*
Case		
Indicators	access, power	access
AC fuse	none	none
Fan	yes	no
Size (L x W x H, inches)	11 x 10 x 3.5	12 x 6 x 2
Weight (pounds)	9 lb	4 lb

^{*}Works with European electricity but must be manually configured.



Toshiba's XM-3201 A1 MAC is a close second. It's fast, lightweight, very well built, and inexpensive. And although the power supply is built in, the drive is only slightly larger than the Porta-Drive. Unfortunately, both CD Technol-



ogy's and Toshiba's drives lack good audio facilities.

If you're a professional musician, the OMI ProCDP (\$1,488) is for you. The price is quite a bit higher than those of the other CD-

ROM drives, but you get output jacks common in the music industry and the convenience of 19-inch rack mounting. Although its access

times were not among the best, its throughput was just slightly less than that of the Toshiba-based drives.

The **AppleCD SC** (\$1,199) is the patriarch of CD-ROM drives. It's slower than the leaders but manages to stay far ahead of two of its newer challengers. It's solidly built and intelligently designed, but — as with some of Apple's other peripherals — you pay a premium for the Apple logo.

We would pick Apple's drive over the Denon DRD-253 (\$990) and NEC CDR-77 (\$999 for the drive, \$199 for essential software and cable). Both use outdated drive mechanisms and turned in real-world performances that were agonizingly slow.

Predictions that a CD-ROM drive will be connected to every Mac are about as accurate as the predictions of flying cars at the 1939 New York World's Fair. Not every user needs such a drive, just as not every user needs a laser printer. But if you can use CD-ROM right now, there's no need to wait any longer to buy a drive. CD-ROM drives for the Mac are less expensive, faster, and more convenient than ever before.

John Rizzo is *MacUser*'s technical editor. He has covered the development of optical drives for more than two years, and he still thinks 650 megabytes is a lot of space.

Acknowledgments

MacUser Labs would like to thank the members of its advisory panel: David Bowman of Hub Associates and Kevin Countryman.

			* n', 1	
Denon DRD-253	NEC CDR-77	OMI ProCDP	Toshiba XM-3201 A1 MAC	
\$990	drive, \$999;	\$1,488	\$970	
	software/cable, \$199	31,400		
Denon	NEC	Sony CDU-510-12	Toshiba 3201-B	
horizontal	horizontal	horizontal	horizontal or vertical	
1 year	1 year	1 year	1 year	
an Translate	ME TO SOUTH A CALL		APPEND A PAGE BY	
RCA phone jacks	RCA phone jacks	1/4-in. phone jacks	none	
1/8-in. miniphone jack	1/8-in. miniphone jack	1/4-in. phone jack	1/8-in. miniphone jack	
knob	knob	knob	three-position switch	
yes		no	no	
none	Music Box, NeCdPlay, NeCdStop	none	none	
			Service of the servic	
one 50-pin	two 50-pin	two 50-pin	two 50-pin	
internal	plug	DIP switch	plug	
DIP switch	DIP switch	DIP switch	DIP switch	
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rear	rear	front	rear	
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SCSI Accelerators

MacUser Labs tested four NuBus boards that try to break the SCSI bottleneck. The results are surprising.

cons make the Mac easy — even fun — to use, but there's one icon we all dread: the little wristwatch. You can minimize the time the watch is on-screen by adding a CPU-accelerator board, installing a faster hard-disk drive, or buying a speedier Mac. However, any improvement eventually runs up against an insurmountable bottleneck: the rate at which data travels to and from the hard drive (see Figure 1). Any improvement in this data flow is a welcome relief to users whose work is often

interrupted while enormous files move slowly in and out of their Macs. If you can speed up practically everything else on a Mac, why not the hard-drive-to-Mac connection?

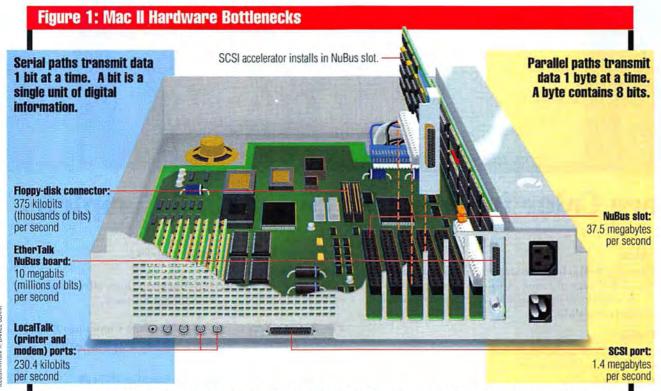
Over the past year, four manufacturers have introduced NuBus boards for the Mac II family that attempt to increase the speed of this data path. Can any of these SCSI accelerators be a valuable addition to the average Mac II user's equipment arsenal? To find out, MacUser Labs tested Pronto from Golden Triangle, Macceler-

ate from National Semiconductor, Surf-Board from Jets Cybernetics, and Super-SCSI from Eclipse Technology. After extensive real-world testing, the results were not at all what we expected.

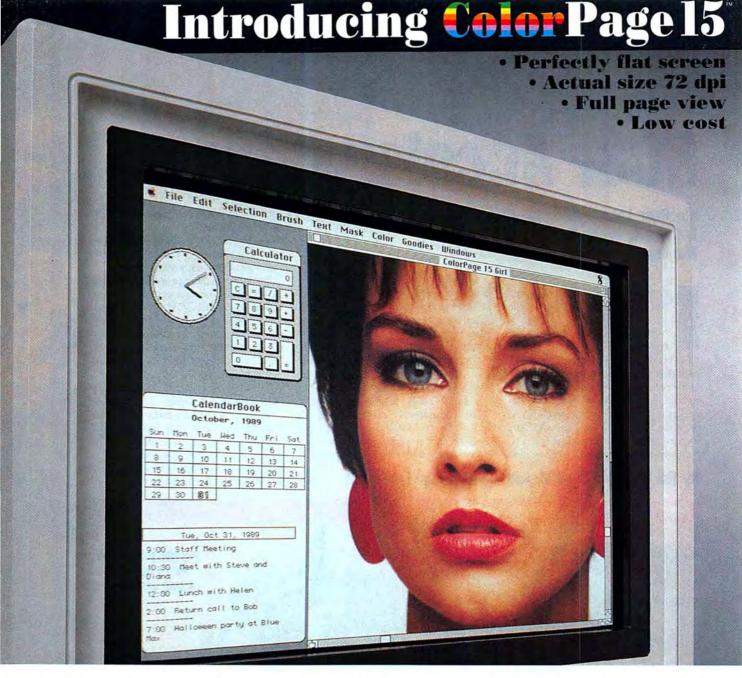
The target of these boards' effort is the Mac's small computer system interface, better known as the SCSI ("scuzzy") port. The SE and later models of the Mac have two of these ports: one inside to manage the internal hard drive and one on the back for a chain of up to seven external SCSI peripherals — hard drives, CD-ROM players, scanners, and/or other SCSI-equipped devices.

When it was first introduced on the Plus, the SCSI port's top speed was 263 kilobits per second. Over the years, its performance has improved, and the SCSI port in the Mac II family now tops out at 1.4 megabytes per second.

By Tim Standing, Paul Yi, and the MacUser Labs staff



Although many factors influence the rate at which information can flow between a Mac and its peripherals or a network, no data can exceed the top speed of each path to the CPU. In most cases, real-world performance is well below these theoretical top speeds.



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List price	\$595	\$745 with 64K cache \$975 with 128K cache \$1,195 with 256K cache	\$1,295	\$989
SCSI chip	DP8490V	WD33C93A	NCR53C90A	NCR5590
Uses DMA	yes	no	yes	yes
On-board cache size	NA	64K, 128K, or 256K	NA	NA
Connector to external SCSI device	DB-25 connector	DB-25 connector	no*	DB-25 connector
Total SCSI ports when installed	2	2	1	2
Selectable termination	yes	yes	no	no
Enable/disable from Control Panel	yes	yes	yes	no
Method of software supply	disk	disk	disk	EEPROM on board
Supports A/UX	yes	no	yes [†]	no [§]
Varranty	5 years	1 year	1 year	45 days
Manufacturer	National Semiconductor Mail Stop 34-10 2900 Semiconductor Drive Santa Clara, CA 95052-8090 (800) 538-8510 outside CA (800) 345-4006 inside CA (408) 721-5000	Golden Triangle Computers 4849 Ronson Court San Diego, CA 92111 (619) 279-2100	Jets Cybernetics The Penthouse 535 Ramona St. Palo Alto, CA 94301 (800) 365-5387 (415) 322-5387	Eclipse Technology 6714 Marbo Court Falls Church, VA 22046 (703) 538-2291

Although SCSI speed has improved, hard-drive manufacturers have remained one step ahead. The first SCSI hard drive, the AppleHD 20SC, is considered slow today, but it's twice as fast as the Plus' SCSI port. Today, the MicroNet Wren SB-330 hard drive can provide bursts of data at 3 megabytes per second, more than twice as fast as the Mac II's SCSI port. The ATTO SiliconDisk - 24 megabytes of high-speed RAM masquerading as a hard drive - can double the Wren's performance.

In reality, such high transfer rates are rare, since Finder overhead and various delays associated with hard-drive technology reduce throughput considerably (see "101 Hard Drives," February '90). But during those brief moments when data is bursting from a hard drive at top speed or streaming out of the SiliconDisk at 6 megabytes per second, a 1.4-megabyte-per-second SCSI port simply can't keep up. No matter how fast a SCSI peripheral pumps out data, it can't enter the Mac any faster than the SCSI port's top speed.

The solution seems obvious: Speed up the SCSI port. Tired of waiting for Apple to take this route, the manufacturers of SCSI accelerators put newer, faster SCSI chips onto a NuBus board and use complex data-management shortcuts in an attempt to break the 1.4-megabyte-persecond barrier.

Sound good? That's what we thought too. We reasoned that these boards might help any Mac II, since all four are readily available to the average Mac user. Some manufacturers warned us, however, that even though their boards could be quite powerful in specialized situations, we might not see dramatic improvements right out of the box.

When we ran the SCSI accelerators through simulations of normal, day-today activities, we began to understand why this caveat was necessary. In most cases, these purported "accelerators" were actually SCSI decelerators when compared with the SCSI port that comes standard on later-model Macs.

Sound incredible? Read on.

Get It In, Get It On

First we evaluated each board's installation procedures. All the boards slipped neatly into a NuBus slot, although the SurfBoard gave us a bit of trouble because it has a large capacitor jutting out from each corner - it is awkward to install another board in the adjacent slot.

The boards vary in how they connect to the Mac's internal hard drive and to external SCSI peripherals. The Pronto and SuperSCSI are the simplest, since they provide a new external SCSI port, accessible through one of the NuBus openings at the rear of the Mac II. The Maccelerate and SurfBoard are a bit more complicated. The SurfBoard provides no new SCSI port and instead takes over the Mac's existing external port. Maccelerate does provide a new SCSI port, but it requires all SCSI devices to be in a loop, We know what you've been waiting for. An easy way to compose music on your MIDI keyboard, refine your creation in notation and get publishable results.

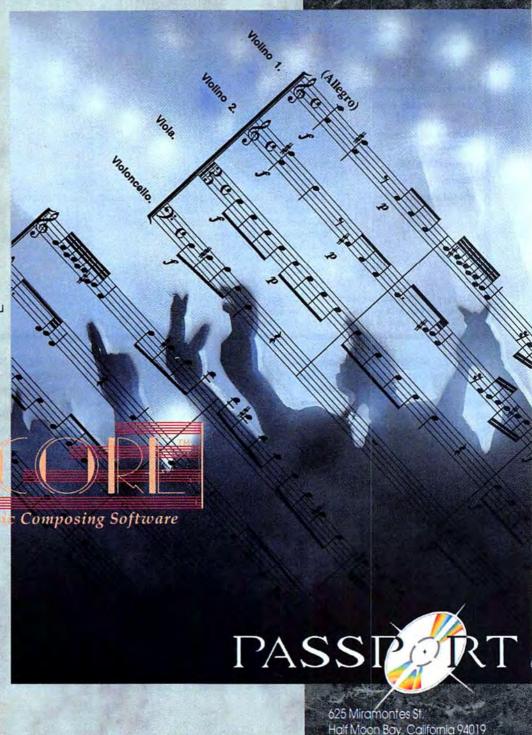
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with one end of the loop connected to the Maccelerate's port and the other end connected to the Mac's existing SCSI port.

Since the Maccelerate and SurfBoard use the existing SCSI port, they won't be able to take advantage of a planned enhancement in System 7 — the ability to recognize two seven-device chains of SCSI peripherals instead of the single chain System 6 permits. If National Semiconductor rewrites its driver software so that the Maccelerate doesn't need to use both ports, it also could benefit from System 7.

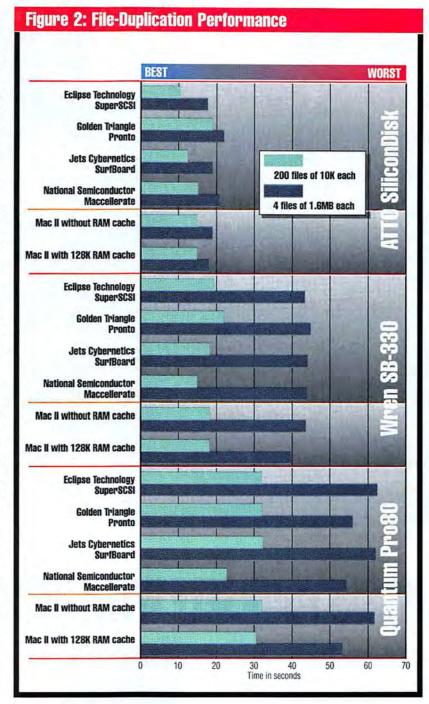
After you've installed the hardware, three of the boards require that you also place files containing their driver software in your System Folder. The Super-SCSI keeps its software in an on-board EEPROM (electrically erasable, programmable read-only memory) chip, where it can easily be updated with utilities supplied by Eclipse Technology. The disadvantage of this method is that you can't turn the Super-SCSI on and off from the Control Panel, as you can with the other accelerators.

Our first evidence that SCSI accelerators might not be appropriate for all users was when we discovered that the software supplied with the Maccelerate and SurfBoard replaces the driver software of any attached hard drive. Since some hard drives use unique driver software with special features such as partitioning and password protection, both the Maccelerate and SurfBoard may have trouble recognizing these special features — or even the entire hard drive. For example, we couldn't get the Maccelerate to recognize partitions on a Jasmine hard drive.

The Pronto and SuperSCSI don't interfere with hard-drive features because their software works at a deeper level of the system. These two boards should be compatible with a broader range of SCSI devices than the Maccelerate and Surf-Board are. But beware that SCSI in the Mac world is far from standardized. For example, none of the SCSI accelerators recognize ejectable media such as cartridge drives or certain optical discs. (However, Pinnacle Micro, in collaboration with Golden Triangle, has added new firmware to the Pronto board to make it compatible with Pinnacle's own REO optical drives.)

The Winner: Nobody

We tested each board's performance with three SCSI peripherals: the RAM-



Speed is of the essence in SCSI performance — the less time it takes to copy a file, the better. We pitted four SCSI accelerators against an unaccelerated Mac II with and without its system RAM cache enabled. We duplicated two folders, one containing 200 files of 10K each and the other with four files of 1.6 megabytes each. Each accelerator was tested with an ATTO SiliconDisk and Wren SB-330 and Quantum Pro80 hard-disk drives. Surprisingly, the unaccelerated Mac II with its RAM cache set at 128K outperformed all the accelerators when duplicating small files and matched the accelerators' performance when transferring large files.



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SCSI Accelerators

in-a-box ATTO SiliconDisk, the very fast MicroNet Wren SB-330 hard-disk drive, and a Quantum Pro80 hard-disk drive identical to the one that Apple ships in all high-end Macs. The Quantum is the slowest of the three devices — but with a transfer rate of around 1.5 megabytes per second and a 19-millisecond access time, it's no slouch. We disabled the Quantum's DisCache feature to ensure that we measured only the performance of each SCSI accelerator board and not the speed of the Quantum's caching scheme.

We first timed the duplication of two folders, one with 200 files of 10K each and the second with four files of 1.6 megabytes each. Duplicating numerous small files requires the computer to access many different areas of the hard-disk drive in rapid succession, which slows down the throughput rate. On the other hand, large files can be speedily written in large segments to a single part of the disk. Each test cycle consisted of a read, a write, and a second read to verify the write. We also ran the same set of tests on a Mac II without a SCSI accelerator installed, once with the system RAM cache set at 128K and once with no RAM cache.

The results were surprising (see Figure 2). In most cases, the SCSI accelerators reduced performance to below that of a standard Mac II using Apple's RAM cache. There were exceptions: the Maccelerate's performance transferring 1.6megabyte files to and from the Quantum and Wren hard-disk drives, and the performance of the SuperSCSI and Surf-Board on the SiliconDisk with the same large files. However, these anomalies can't disguise the glaring fact that no SCSI accelerator consistently and significantly improved the Mac's ability to move data to and from a hard drive. In most cases, the "accelerators" actually slowed down the transfer.

Try, Try Again

To give the accelerators another chance, we trotted out DiskBasher!, an exclusive MacUser Labs benchmark that is an excellent predictor of real-world hard-drive and SCSI performance. We limited our testing to the fastest SCSI peripheral, the ATTO SiliconDisk, because its raw speed gave the accelerators their best chance of success. After a day of testing, the news wasn't good for the manufacturers of the Maccelerate, Pronto, and Surf-Board — their boards were all outperformed by the Mac II even without the

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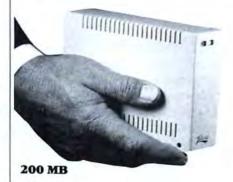


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SCSI Accelerators

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However, we did find our first significant improvement: The SuperSCSI board not only beat the Mac II, but it also completed the DiskBasher! tests nearly twice as fast as did its competitors. To be honest, we couldn't figure out why SuperSCSI did so well in this test and so poorly in others, so we gave it — and all the other boards — another chance.

We set up an Ethernet network using a Mac IIx as the server, the Wren as its hard-disk drive, and an SE as the client.

hese purported 'accelerators' are actually SCSI decelerators.

We then read a 500K PageMaker file from and wrote it to the Wren. Since EtherTalk's speed demands a high-performance server, we hoped this torture test would spread out the pack.

By this time, we weren't surprised that three of the SCSI accelerators either had little effect or actually reduced performance. The SuperSCSI again led the pack when reading data from the server — but with an almost meaningless 2-percent improvement over the Mac IIx. And each time we tried to write to the server, the SuperSCSI crashed the Mac IIx. The only way to recover was to restart the Mac — hardly an acceptable performance by the SuperSCSI, and the end of our hopes for SCSI accelerators as the answer to day-to-day wristwatch delay.

Why Pronto Isn't

We were most surprised by the Pronto's performance. It uses a SCSI chip that's three times faster than the chip used in all Macs, plus it has a data-caching technology similar to the Mac II RAM cache that led most of our tests.

A data cache is a waiting room for data coming from a SCSI peripheral. As each byte arrives, it's placed in the cache memory. (The Pronto is available with RAM configurations of 64K, 128K, and 256K; we tested the 128K model.) When all the bytes from the hard disk have arrived, the Pronto signals that they are ready to be copied into RAM by the Macintosh's microprocessor. During this

caching process, the Mac's microprocessor is free to work on other duties and can be interrupted at any time to handle inputs such as mouse movements.

The big advantage of this method is that the most recently accessed data remains in the cache memory, where it can be grabbed and copied into the Mac's memory almost instantaneously, without reaccessing the hard disk. Moving data from the NuBus board's memory to Mac memory is much faster than moving it off a hard disk, over a SCSI cable, through the Mac SCSI chip, and then into Mac memory. In addition, "smart" caching software - like that in the Pronto - also reads additional data from the same area of the hard disk into the cache, betting that the next request will include some or all of this extra data.

Pronto requires you to set cachememory sizes for each device you have attached to its SCSI port, as well as for what Golden Triangle calls generic I/O (input/output), which is necessary for cache overflow and other activities. Currently this chore is done with a cdev, but Golden Triangle is working on software that will automatically configure your system for top performance. Until this software is shipped, you must experiment with different cache sizes yourself. We tried many different combinations with each SCSI device (the results we quote reflect only the best performances), and discovered that finding the right combination is not a simple matter.

What's worse - and it may be one reason for the Pronto's disappointing performance - is that the Pronto won't transfer any data into the Mac's memory until the cache area has been completely filled. If you set the cache too large and the Pronto is unsuccessful in filling the cache promptly with data that it bets you will soon need, you must wait until the Pronto tries again (and maybe again and again) before your Mac gets even the first byte it needs.

This isn't to say that the Pronto is a useless device. Golden Triangle acknowledges that the Pronto works best "in combination with products from cooperating third-party developers." DuPont,

Acknowledgments

MacUser Labs would like to thank Charles McConathy of MicroNet and John T. Keller of ATTO for the loan of test equipment.



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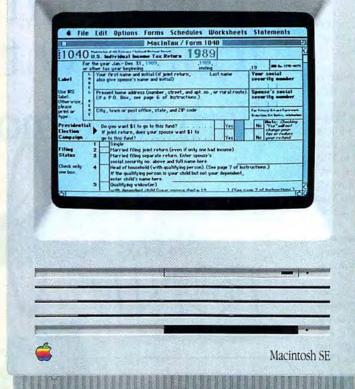
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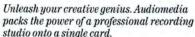
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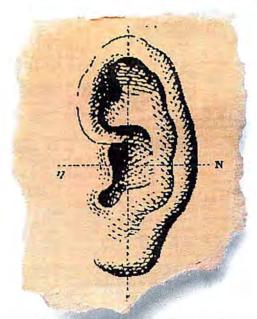
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for example, requires a Pronto in the Mac that drives its \$75,000 4CAST color printer, and 68000, Inc., uses one in its high-end Dash 30 WORKSTATION. In both cases, however, very specialized software was written to make the Pronto effective — not something the average user should be asked to do.

DMA Disappointment

In addition to faster SCSI chips, the three remaining SCSI accelerators—the Maccelerate, SuperSCSI, and SurfBoard—all use DMA (direct memory access) in their attempt to speed up the SCSI port. DMA boards relieve the Mac microprocessor from the job of moving data into memory, ostensibly freeing it to perform other tasks. However, while the DMA board is performing this chore, it takes over the NuBus and disrupts the Mac microprocessor's access to memory. There's not a lot left that the Mac can do.

In addition, Apple warns that the Mac doesn't support DMA (see *Macintosh Technical Note* #221). When the Mac's microprocessor is prevented from accessing its own memory, as it is when a DMA board takes over, it may have a problem responding to new inputs such as Local-

Talk or EtherTalk messages or mouse movements. This is exactly what we found when we tested the SuperSCSI board on EtherTalk.

Though of little value to the average Mac II user, the three DMA boards should be of some benefit to A/UX users. This UNIX-like operating system from Apple offers true multitasking and thus allows DMA transfers while freeing the microprocessor to access memory and respond to new inputs.

Although both National Semiconductor and Jets Cybernetics emphasize the value of their boards in the A/UX environment, only the Maccelerate ships with fully functional A/UX software. When we tested the Maccelerate's performance in a busy multitasking A/UX environment, it improved SCSI performance by a full 20 percent.

Jets Cybernetics does offer A/UX software, but — like Jets Cybernetics' software for the standard Mac operating system — it's only a beta version. (Unlike any commercial product we've ever seen, the SurfBoard ships with software clearly marked as beta — hardly a confidence-inducing practice.) Eclipse Technology is working on A/UX software for the SuperSCSI board, and Golden Triangle is doing the same for the Pronto.

Too Little, Too Early

If you want to speed up your Mac and you don't use A/UX, we've got good news and bad news. The good news is that dedicated engineers are working hard to develop a new class of performance enhancements called SCSI accelerators. The bad news is that they can't yet help you break the SCSI bottleneck — their devices offer little or no performance increase for the average Mac user.

Even though certain combinations of SCSI devices and tests show minor performance enhancements, none of the boards we tested offers an overall solution. If you want faster SCSI performance, wait for the Mac IIxi, which should finally upgrade the old SCSI chip. Or just buy more SIMMs, since the Apple-supplied RAM cache in every Mac's system seems to perform just as well or better than any current SCSI accelerator.

Tim Standing is a software engineer and the author of several articles about SCSI. Paul Yi is an associate project leader in MacUser Labs.



The Bottom Line

Traditions are made to be broken. Each time MacUser Labs tests a group of products, we single out one or two as the best values and give the reasons for our recommendations. This time around, however, we can't recommend any of the SCSI accelerators we tested. Some may have limited value in very specialized situations, but our tests — designed to simulate real-world situations — prove that they're of little use to the average Mac user.

If you're one of the rare Mac II users who uses the A/UX operating system, the Maccelerate (\$595) from National Semi-conductor may be of some interest. With the standard Mac system, the Maccelerate also provided some improvement in moving enormous files to and from the Quantum Pro80 hard-disk drive (standard on all high-end Macs). However, unless you spend most of your time working on immense graphics or sound files, you won't notice any improvement.

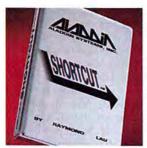
When connected to the superspeed ATTO SiliconDisk, Eclipse Technology's **SuperSCSI** (\$989) performed decently in our DiskBasher! tests and also managed to improve the throughput of giant files. But its performance in most of our other tests was as mediocre as the rest of the boards'. In addition, the SuperSCSI repeatedly crashed the server when we used it on a network. There appears to be some promise here, but we suggest you wait for further refinements.

The board that puzzled us most was Golden Triangle's **Pronto** (\$745 to \$1,195, depending on cache size). Since it uses a proven

technology, RAM caching, we assumed that the Pronto would at least perform close to expectations. However, its clumsy cache-setting system and its poor data-handling techniques made it a disappointing performer — it was especially slow when connected to a network. There's a chance the Pronto might improve when Golden Triangle releases smarter software to control its cache management, but we're not holding our breath.

Even in a field as weak as this, one product must finish last. The SurfBoard (\$1,295) by Jets Cybernetics earns that distinction among SCSI accelerators. Its performance was mediocre to poor on all tests except the duplication of enormous files, using the ATTO SiliconDisk. The SurfBoard is expensive, it's shipped with beta software, and it doesn't include the one potentially important feature offered by the other three SCSI accelerators — an extra SCSI port in anticipation of System 7. The people at Jets Cybernetics told us they were "more interested in facilitating the future than in saving the past." If that's the case, we recommend that you wait until you see what the future brings before purchasing a SurfBoard — it's not ready for today's marketplace.

Or is the marketplace not ready for it and the other SCSI accelerators? If future operating systems support DMA or if future peripherals can provide sustained high-speed data-transfer rates, SCSI accelerators may become popular and useful tools. When that day comes, MacUser Labs will retest, reevaluate, and rethink our conclusions. But until then, we recommend that you leave these boards alone. **Satisfaction Guarantee:** Besides 30 and 60 day manufacturer warranties on most products we offer, you get MacZone expert advice to help you get the most from VOUL equipment.



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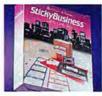
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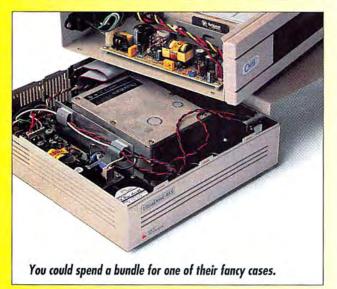
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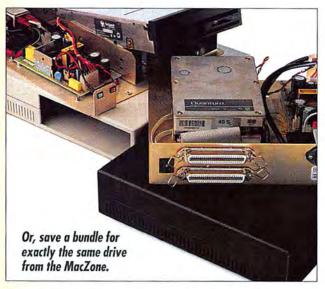
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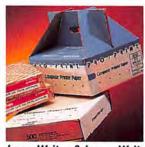
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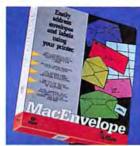
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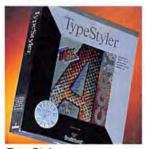
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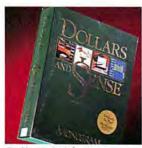
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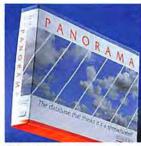
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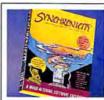
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POWER TOOLS

EDITED JAMES BRADBURY

Directory **Assistance**

ost Mac applications open and save documents in the same way: When you choose Open from the File menu, you see a dialog box with a scrolling list of filenames below the name of their folder. When you choose Save As (or Save for the first time), a similar box is displayed, with a field for entering the new filename. These directory (or SF, for standard file) dialog boxes work pretty well, but they have some frustrating limitations. For

Magnus Software's FileMagic adds features such as custom file and folder menus. Its hierarchical menu includes submenus that allow instant access to preferred files and folders. The INIT comes with modules that, when copied into your System Folder, provide a Find File clone; an enhanced Copy command; and a Finder-like implementation of Get Info that lets you change filenames, types, and creators.

Unfortunately, though, FileMagic's confining interface unnecessarily circumvents

Apple's file-navigation method by replacing the standard folder menu. Other SF utilities avoid that conflict by putting their



proprietary menus into an unused part of the SF dialog box so you can still access the old menu.

FINDSWELL"

Working Software's Findswell, one of the first commercial dialog-box enhancers, adds a button beneath the folder menu. Clicking on it reveals a

new dialog box, in which you can enter search criteria for all or part of a filename. Once the file is found, Findswell can open it directly.

Robert Churchill's Zephyr cdev is the sleeper of the commercial lot because it is published by an individual rather than a software company.

You can download a functionally crippled demo from online services such as Compu-Serve. Those who order the package receive a full-featured product that can change, delete, and find files, and a Hyper-Card tutorial. It lacks naviga-

tion enhancement like that in the other utilities, however.

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☐ Iransfer to list

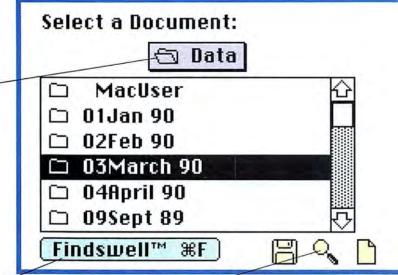
Cancel

Zephyr is swift and refreshing enough to earn its moniker, but learning to use it may knock the wind out of you. Its unique interface substitutes mini-icons at the bottom of the SF dialog box for the pop-up menu other utilities use, providing more direct access to Zephyr's functions at the expense of their clarity of pur-

> pose. But its full support for the keyboard compensates greatly for these ambiguous, untitled icons, and the cdev even includes a built-in editor for controlling the fonts, size, and layout of its own dialog boxes.

Planned enhancements to

Zephyr include on-line help that better demonstrates its usefulness, and improvements to the sometimes perplexing interface. Zephyr could also benefit from some printed documentation to win fans from among the less technically oriented.



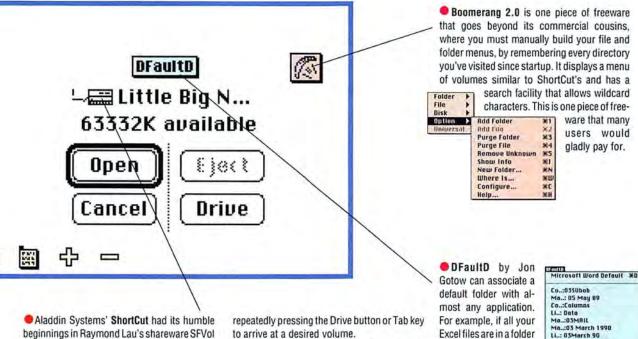


example, they display the contents of only one folder at a time. As folders branch down and away from the top (desktop-level) folder in the upside-down "tree" of the Mac's Hierarchical File System (HFS), you must climb up or down the branches to access remote folders. The desktop level of the tree is the level that displays the name of the device being searched - a floppy or hard drive, for example. As you delve deeper into folders within folders, you are moving "down" the tree.

If the file you need is in the currently open

folder, you simply scroll to it and open it. But if it's somewhere else, you may have to select the pop-up folder menu to reach the desktop-level directory, only to scroll and double-click a few more times to laboriously wend your way back down a different branch. Here are some directory dialog box add-ons - some commercial, some freeware or shareware - that can tame the HFS beast.

By Ross Scott Rubin



beginnings in Raymond Lau's shareware SFVol INIT. ShortCut's menu, which pops up from

the volume title, minimizes file-menu clutter by displaying only the names of the files that the current application can open. Invoking ShortCut while pressing the Option or Command key brings you directly to its file or folder menu. Short-Cut can create and enter new folders; retrieve file information (including AppleShare access privileges); find, rename, and delete files; erase entire disks; and

enlarge the SF dialog box to display more files at once. ShortCut can also locate, decompress, and open files within Stufflt archives.

ShortCut's ability to assign numeric keyboard command equivalents to up to ten mounted volumes - a boon to users of TOPS or partitioned drives - ends the drudgery of to arrive at a desired volume.

Little Big Number MacUser Edit 1,Little Big Numb

New Folder... Go To Folder

Open file find... Get Info

Unstuff...

Help... About Shortcut".

Like Claris' MacWrite II. ShortCut boasts an

outstanding, complete - but largely unnecessary - graphical hypertext on-line help system through which you may want to occasionally browse to review its advanced features. (All other features work perfectly without the easily removable Help file.)

ShortCut also has some

shortcomings. The ability to copy and move files would be a welcome, but not critical, addition. Although ShortCut's unstuffing feature has a good interface, transparent on-the-fly decompression while opening documents would fully integrate ShortCut into Open dialog

Co.::Columns
Ll..: Data
Ma.::OSMRIL
Ma.::OSMBIL
Ma.::OSMBIL
Ma.::OSMBIL
Ll.::OSMBIL
Ll.::OSMBIL
Ma.::OSMBIL
Ma.::OSMBIL
Ma.::OSMBIL
Ll.::Zunused

in that directory ready to open every time you choose Open in Excel. The directory will stay open to accept new files when you issue the Save command

called Accounts, you

can neatly have the files

But what if you'd like Excel to default to New Accounts at the first of the month? You can link New Accounts to Excel in a different link set you choose at the month's beginning. DFaultD, a shareware steal, makes an excellent companion to the commercial offerings, because most folder hopping occurs when you first start up an application.

POWER TOOLS



Product Directory

Boomerang 2.0

By Hiroaki Yamamoto Lawrence Berkeley Lab 50B-6208 Berkeley, CA 94270 (415) 486-6407 Freeware

DFaultD 2.0

By Jon Gotow 5508 Hobart St. Pittsburgh, PA 15217 Shareware, \$15

DialogKeys

CE Software 1854 Fuller Road P.O. Box 65580 West Des Moines, IA 50265 (515) 224-1995 \$99.95 (included with QuicKeys)

FileMagic

Magnus Software 9025 61st Place W. Mukilteo, WA 98275-1789 (206) 828-1789 \$99

Findswell

Working Software, Inc. P.O. Box 1844 Santa Cruz, CA 95061 (408) 423-5696 \$59.95

Front and Center

Pete Helme 1939 Marshall Ave., #25 St. Paul, MN 55104 Shareware, \$10

Rebound

By Fred D. Reed Freeware

SFScroll

By Andy Hertzfeld Freeware

ShortCut

Aladdin Systems 217 E. 86th St., Suite 153 New York, NY 10028 (212) 410-3080 \$79.95

Zephyr

Robert John Churchill 1336 Geddes, Apt. #7 Ann Arbor, MI 48109 \$59.95

More File Finders

Some of the features of the commercial packages first appeared in freeware INITs such as Andy Hertzfeld's SFScroll and Fred Reed's Rebound, which automatically highlight the last file accessed in a folder. Pete Helme's shareware program Front and Center can center dialog boxes on the cursor.

DialogKeys, a commercial cdev included with CE Software's QuicKeys, lets you highlight and select radio buttons and check boxes in dialog boxes without touching the mouse.

Once you've developed a taste for enhancing the world according to Apple, you may

decide to swear off the Finder entirely and switch to more-efficient third-party programs such as Fifth Generation Systems' Power-Station, CE Software's DiskTop, or ICOM Simulations' On Cue, which lets you preselect the files you use most often, keeping this directory of hot files readily accessible at all times. (See "Losing Your Finder," September '89, for details on how to go about it.)

As long as you're still using the Finder, though, any of the utilities I've mentioned can make file navigation and management a simpler task, meaning you can stop wasting time looking for your work and start spending more time doing it.

If a souped-up directory still isn't fast enough, maybe it's time to abandon the Finder.



Search the Directory Dialog Box

You've just selected Open from the File menu to find yourself staring at a folder with multitudes of files. How can you speed up your search for a file that's in the middle or toward the bottom of the list?

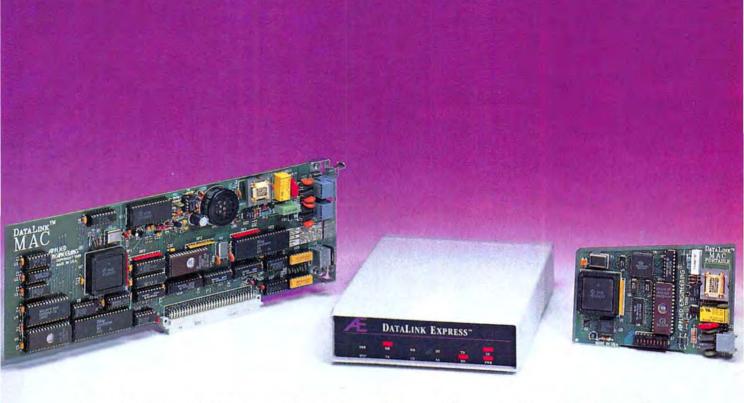
- Scrolling or using the arrow keys lets you see every file in a folder, but these are also the slowest ways to search the directory dialog box.
- No matter how you have your view set in the Finder windows, the directory dialog box always lists files in alphabetical/numerical
- order. Typing the beginning letter (or number) of the filename takes you right to the file or to a range close to it. If the file is near the bottom, try typing Z.
- Typing the tilde (~) key takes you to the very bottom of the list.

These techniques also work on windows in ResEdit, Symantec Tools, DiskTop, and DiskTools II, but they don't work with all file editors. You might find other instances in which these work — drop us a line if you do.

- Kristi Coale

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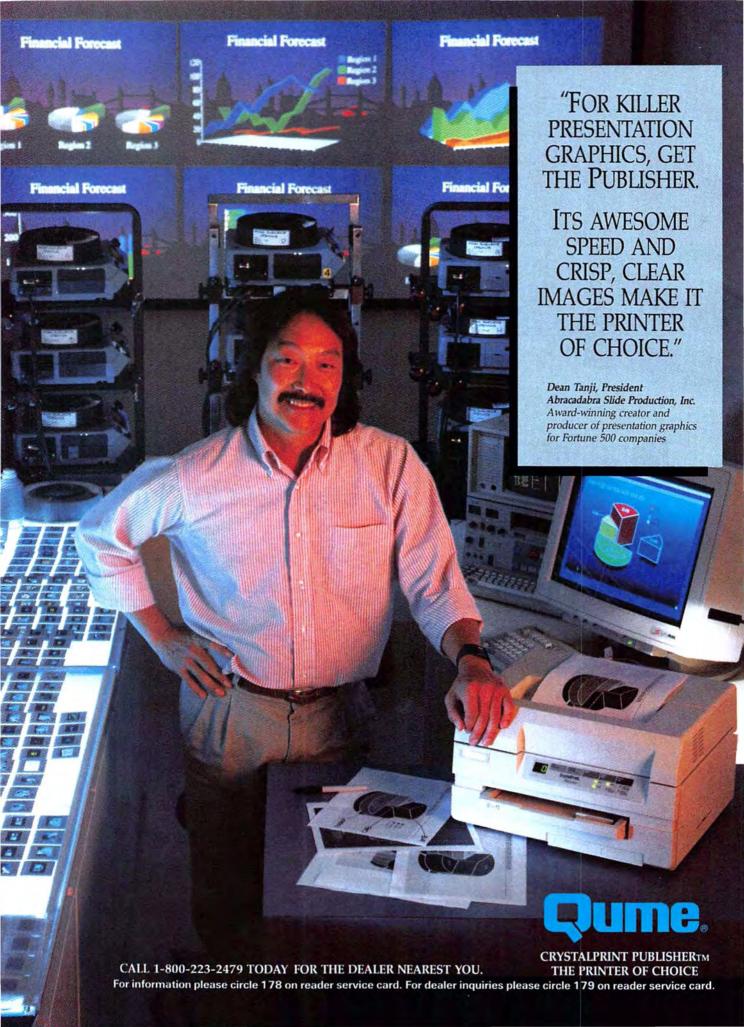
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Cache Consciousness

I have written here before (in January 1990, to be exact) of what I call the Clipboard mindset. The idea was to suggest a profitable way to approach working on the Macintosh, using tools such as the Clipboard with maximum efficiency. Some of you readers may have thought the idea was to think like the Mac Clip-

board. Well, it was, kind of. When you're out to beat the San Francisco 49ers, it doesn't hurt to try to think like Joe Montana, and when you're out to Beat the System, it doesn't hurt to try to think like a system-software component.

This month I want to suggest a way of thinking that can speed up some of the most annoying delays in using the Mac. If you'll forgive one more mechanomorphic neologism, it's time for

us to attain "cache consciousness."

If I've set this up properly, you'll correctly take cache consciousness to mean the intriguing notion "thinking *like* a cache" rather than the boring idea "thinking *about* the cache." You won't, I trust, think I'm referring to such passé 1980s topics as pinching pennies and maximizing profits, although thinking like a cache should positively impact the bottom line, as they used to say in the quaint language of the past decade.

So what exactly is a cache, and how does it think?

A cache (or RAM cache) is a portion of memory (RAM) set aside to hold information recently read into RAM from the disk. With the information still in RAM, the Mac may be able

Caching in Efficiently

System/Finder

Memory

System/Finder

Memory

System/Finder

Memory

System/Finder

B

Memory

Think like a cache, and you'll avoid situations such as this. After the user closes applications A and C, application D can't find enough contiguous memory even though there's enough total memory for both programs. The user must quit from application B and reload it before B and D will fit.

to move that information from one place to another in (fast) RAM the next time you need it, rather than having to read it into RAM again from the (slow) disk. You can't use an application or a document unless it's in RAM, and a cache causes code or data that *might* be used again to remain there.

Your system comes with a cache. If you pull down the Apple menu and select Control Panel, you should see a RAM cache among the adjustable features. You can turn it on or off and raise or lower the amount of memory assigned to it. The more memory it has, the more code and data it can keep in RAM.

There are many varieties of caches, most of which are of no interest or use to us here, including — unfortunately — the one that

Apple put into your system. But the characteristic of a cache that is both interesting and useful is its habit of holding onto recently used stuff, keeping it handy in case it's needed again. Data, program code, whole applications - it doesn't matter so much what the cache is keeping as that the cache operates according to a sage rule of thumb: If you've used it recently, you are more likely to want to use it again soon, reasons the wise cache.

Now forget about real caches for a while, and just hold on to that bit of wisdom that caches have imparted to us.

As you'll see, it can take us quite a distance.

Mostly Adequate

Chances are, you find the performance of your Mac adequate most of the time. No, really. Those times when its performance is inadequate — when you're moving through large documents, opening and closing files, starting up and shutting down, and starting and leaving applications, for example — have an annoyance level that goes beyond the length of the delay. They are annoying because they make you wait when you are ready to act. What all these operations have in common is this: They move things between disk and RAM. When you load an application or open a file, you cause it to be copied from disk to RAM. During this procedure, you wait.

By Michael Swaine



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POWER TOOLS



Some waits are more annoying than others. Saving your work, which you should do frequently, also involves shuttling bits between RAM and disk, but it's usually less annoying than the time spent opening a document. There is a good ergonomic reason for this: You can fit your saves into the rhythm of your work habits. That doesn't apply to opening documents, though. When you are ready to open a document, you are ready to work on it, and whatever time elapses between starting to open and starting to work is time spent waiting for the machine. Annoying, Other operations can also cause annoying waits: Downloading fonts to a laser printer comes to mind. I'm sure you can think of others.

These kinds of operations hold up progress because they move information between disk and RAM, so thinking like a cache can help you keep the delays they cause to a minimum. Note that I'm not suggesting you use a cache—although that would be good advice if Apple had a good cache—but rather that you manage memory yourself, thinking like a cache. You can apply cache consciousness to managing documents, applications, and the system in general.

Regarding documents, the obvious rule of thumb is: Don't close documents if you're likely to need them again soon. Opened documents have at least one foot in RAM; closed documents don't. Keep them open. Unfortunately, this obvious rule doesn't work. It can have exactly the opposite effect of what's desired.

The problem is that RAM is limited. If a file is too large to fit in the available RAM, the application will swap portions of it in and out of memory as needed. This is why scrolling through a large document is sometimes jerky. If keeping too many documents open interferes with efficient use of the *current* document, you should, of course, close some of them. Being cache-conscious regarding documents won't lead you to any solutions but these basic ones, but this type of thinking will make you more sensitive to the problem, so that you deal with it when it first crops up rather than when it exceeds some annoyance threshold.

If you're running into delays in using documents under MultiFinder, though, you may have another option. You can redefine the amount of memory allocated to an application, just as you can adjust the size of your RAM cache.

If you are finding yourself memory-cramped whenever you use a particular application under MultiFinder, select the application's icon at the Finder level and select Get Info from the File menu. Here you can raise the amount of memory allocated to the application. Under Get Info

you'll see a suggested memory size too. It is often possible to run applications with less than the suggested memory allocation, but it's not a very good idea to do so.

Running under MultiFinder brings up the challenge of managing multiple applications as well as multiple documents. Managing your

use of memory when running under Multi-Finder can mean the difference between being able to open an application when you need it and not being able to open it. The problem here is fragmentation. Multi-Finder allocates only contiguous blocks of memory to applications. Thus, you can find yourself in the frustrating position of having enough memory to run an application without being able to open it, because that memory is discontiguous (fragmented) blocks. Unfortunately, Multi-Finder isn't sophisticated enough to do anything about memory fragmentation to defragment it, you must close and reopen the applications involved, or restart your Macintosh.

But you can avoid most memory fragmentation by thinking like a cache. Which application are you going to want to have open for the longest amount of time? Open that application first. You can completely avoid the memoryfragmentation problem by not closing an application before closing a more recently opened appli-

cation. And if you can just come close to this ideal by thinking ahead when you open more than one application, you will save yourself time and aggravation.

This strategy is not exactly what a cache

Eight Ways to Use The Option Key

Taking up a small amount of real estate on the keyboard, the Option key unlocks many doors for power users.

- 1. Pressing the Option key while launching an application from a floppy disk equipped with its own System Folder prevents switch-launching that is, you can continue operating under the current System (as opposed to the floppy's System). Note that System 5.0 (and later versions) won't let you switch-launch from a hard-disk drive unless you hold down the Option key.
- 2. To *bless* or select a new active System Folder, hold down the Option and Command keys while double-clicking on the Finder icon in the desired System Folder.
- 3. If you're in the Finder and want to use MultiFinder, hold down the Option and Command keys while double-clicking on the Multi-Finder icon in your System Folder. Once you've switched over to MultiFinder, you can't switch back to the Finder without restarting your Mac.
- 4. In the Finder, holding down the Option key while pulling down the File menu changes the Close menu item to Close All.
- **5.** Use the Option key to generate special characters such as the tilde (~, Option-N), registered trademark (®, Option-R), and delta (∂, Option-D).
- **6.** Holding down the Option and Command keys when the Finder launches rebuilds a disk's desktop. Rebuilding the desktop speeds up the process of launching applications.
- 7. With Font/DA Mover open to fonts, you can load fonts into applications or HyperCard stacks if you hold down the Option key while clicking on the Open button for the second window. This lets you access and open applications and stacks in the Font/DA Mover window.
- 8. Under MultiFinder, holding down the Option key and then selecting a DA loads the DA into the Finder's application heap instead of loading it into the DA Handler.







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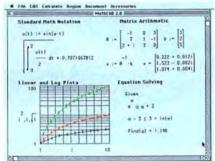
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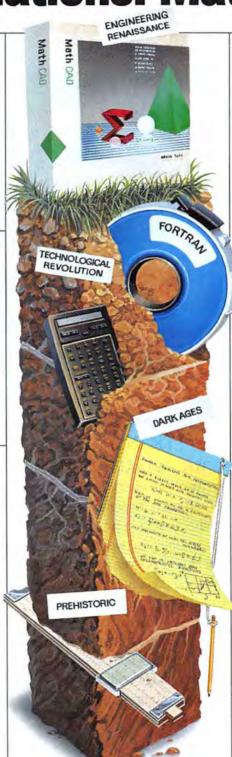


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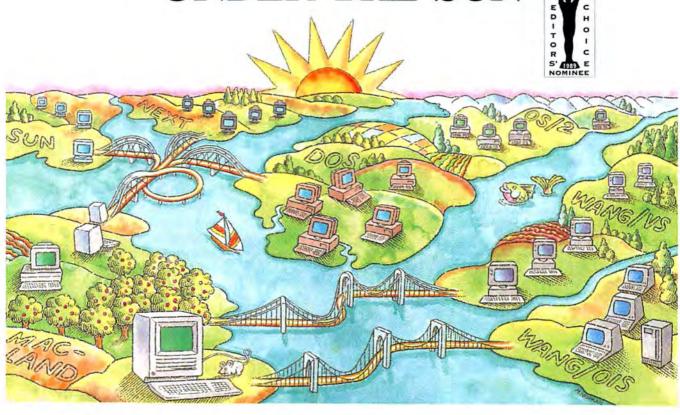
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POWER TOOLS

does, but it involves the question that a cache addresses: What do you need to keep in RAM?

Asking that question can also help you speed up the process of starting up and the process of moving between applications when not using MultiFinder. Startup documents (INITs) in the System Folder get loaded into RAM at startup. If you don't need all of them, removing unnecessary ones will speed startup and give you more memory. You could try some of the techniques discussed in "Losing Your Finder" (September '89) to bypass the Finder, which is one way to speed the process of getting from one application to another.

The Clipboard Cache

Thinking like a cache can help you manage the Clipboard too, because the Clipboard is a kind of cache. It's two caches, you might say, including the Undo buffer. Whenever you cut or copy text, using the menu options Cut (Command-X) or Copy (Command-C), the Mac places the selected data in the Clipboard. The amount of RAM that data takes up is usually trivial, but it can sometimes be substantial. In those instances where it is significant, you can free up some needed RAM by clearing the Clipboard.

Here the trick is to think like a cache not in order to do a cache's job but rather to undo the Clipboard's automatic caching. If you're running short of memory, check to see if you've got something humongous in the Clipboard. If you do (and you don't need it), delete it: Select one character, type Command-C to copy it to the Clipboard, and type Command-C again to put it into the Undo buffer.

The principle behind cache consciousness is so obvious in the real world that it doesn't need mentioning, but in the abstract world of computing, where the things you work with daily are invisible patterns of bits shuffling invisibly between magnetic and electronic storage devices, it's easy to overlook the importance of keeping close at hand the things you will need the most.

Thinking like a cache can help you manage the Clipboard too, because the Clipboard is a kind of cache.

Users Are Winners

I wanted to acknowledge earlier some solvers of the September puzzle, but I was short of space. The puzzle involved a window that filled the entire screen and its parent window sitting in front of it. The question was, how did the parent window get in front of the other window? (If folder A resides in folder B, then the parent window of the window corresponding to folder B is the window corresponding to folder A.)

As many readers pointed out, Jim Finn's Command-drag technique in that same September issue could be used to solve the puzzle. Although I wouldn't call this an easy technique (it requires several moves and selections of windows), it was an easy solution to come up with, and there is something to be said for the first solution

that comes to mind.

The solution that I had in mind (and that came first to many other readers' minds) requires clicking on the title bar of the large window, which causes the other window (its parent window) to be selected and brought forward. This solves the puzzle in one click. You can't get much easier than that.

That solution works, however, only if the Title Click feature of the Finder is active, as many of us think it ought to be. Title Click allows you to work your way back up the hierarchy of windows; clicking on the title bar of any window selects its parent window. Unfortunately, Apple

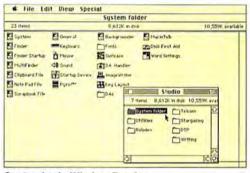
doesn't ship the Finder with Title Click turned on, so you need to use a utility such as Layout or ResEdit to turn on this feature. I recommend doing so; it's quite

A third legitimate solution required knowing that some actions affect a window in some way without actually selecting it. There were several variations on this theme, the most typical

being to resize the window that's filling the screen so that you can get at the target window to close it, click in the resize box of the first window to make it fill the screen again, and then select Open from the File menu, which will reopen the second window in front of the first. Curiously, this was the solution sent by the three youngest puzzle solvers: Craig Woker, 14, Okawville, Illinois; Harald Nagel, 11, Scottsdale, Arizona; and Michael Saji, 9, West Hills, California.

Other approaches included using utilities or a second monitor, or faking it with screen dumps. Robert Greenlaw, Westerly. Connecticut, sent the most solutions (six). I believe those who said that a welltimed triple-click works, but I wasn't dexterous enough to duplicate this solution.

Only two readers out of the hundreds who responded asked what I thought was an obvious question: Why, except to solve the puzzle, would anyone want to do this?



September's Window Puzzler

Apparently the answer was just as obvious. Puzzle solving is mental exercise, and, as so many of the solvers discovered, when you solve puzzles in the knowledge domain you work in, the search for the solution leads you through all sorts of useful information you might never have come upon otherwise.

For simple problems, the first solution to come to mind is often the best - even if there are quicker, slicker, more efficient solutions - simply because it's at hand and they're not. It's in RAM, you might say, and they're out on disk. The charter of this column is to give you a cache of strategies so that more and better solutions come to mind first.

But the best problem-solving strategy anyone has ever discovered is exploration. And that's why I present puzzles in this column. Next month I'll report the winners of the October and November puzzles and present a new puzzle.



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The Case of the Quirky Computer

'When you
have eliminated
the impossible,
whatever
remains,
however
improbable,
must be the truth.'
— Sherlock Holmes

or the past two months, my usually trusty Mac II has suffered a critical case of the digital hiccups. It started when I installed a Radius 24-bit-color system. In went the video boards and out went my sanity.

My Mac's first symptom was something that many leading-edge Mac users are all too familiar with: The machine would work fine for a while, and then, without warning, the cursor would freeze on the screen and the keyboard would go dead. Talk about getting no respect — I wasn't even getting a bomb box.

In situations like this, ya gotta have a system. Since my Mac II had worked per-

fectly for months (not even an "unexpectedly quit" message in MultiFinder!), it was easy enough to assume that one of

Suspect Sleuthing Incorrectly Break down and read installed the manual; call the hardware or manufacturer or software publisher: remove the offending item. INIT or cdev Disable all INITs and conflicts cdevs and then re-enable them one by one; call publishers' technical-support line. SCSI conflicts Make sure no two devices have the same ID; try shorter cables; try longer cables; terminate: unterminate: check for internal termination; read "SCSI Solutions." MacUser. December '89. Two or more Use process of elimination incompatible by installing different programs combinations of software; call publishers' technical-support line. Software bugs Call publishers' technicalsupport line; consult user groups. The inexorable Move to Albania; contact march of local Luddite group; switch to a Mac progress

When your Macintosh acts strangely, you should round up the usual suspects. Start with these.

Plus and System 4.2.

two things was wrong: either the Radius DirectColor or QuickColor boards I had just installed were defective, or the Radius or 32-bit QuickDraw software was being interfered with by something already installed in my System Folder. Since the Radius equipment was brand new; had been installed carefully and exactly as the instructions specified; and didn't seem to have any obvious, observable

problems, I guessed that I was stuck with one of the usual cdev or INIT conflicts that seem so prevalent these days.

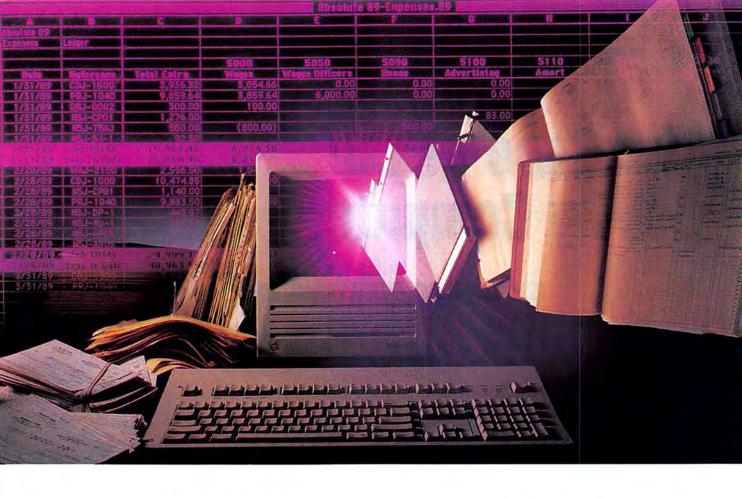
I knew, for instance, that the On Cue INIT has memory problems that interfere with certain other programs I use (such as the THINK C Debugger). But this time around, I didn't really know which, if any, of my INITs was causing the problem. This is where an INIT-manager utility such as CE Software's Aask or Microseeds' INITPicker comes in handy. You can use the INIT manager to disable all your INITs and cdevs and then reactivate them - one at a time until the problem resurfaces. That's a lot easier than performing this disabling chore the old-fashioned way. which involves dragging files around between folders.

Unfortunately, disabling cdevs and INITs didn't help me one bit, although I took all the extra fonts and DAs out of my System file too. In fact, once I'd disabled all the INITs, I noticed that the freeze occurred the first time I pulled down a menu from the menu bar. What would cause that problem?

I eventually got around to playing with hardware, and sure enough, the problem disappeared the minute I removed my Orchid MacSprint II board (a low-cost RAM-caching card that speeds up a Mac II by

15 to 20 percent — one of the cheapest ways to pep up an aging Mac II). Turning the MacSprint II off by disabling its INIT wasn't enough — apparently the card imposes a slight hardware-timing change even when its software is inactive. I then reactivated all my INITs, and everything

By Thom Hogan



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POWER TOOLS



worked again, so I thought I was home free. Little did I know.

Little Boxes

The following week, I received an HP DeskWriter, a Rodime Cobra 215 hard disk, and Adobe Type Manager. I quickly unpacked the drive, formatted it, partitioned it, and copied my backups off Bernoulli cartridges and onto the virgin hard drive.

The first sign of new problems turned up a few hours later when I used File-Maker to print out invoices. The first few came out of the DeskWriter just as they should. Then I looked a little more closely at the fifth page out of the chute. Instead of saying, "Make checks payable to Macreations," the page said "M M... ... Really. A closer examination of the 50 or so invoices I had printed showed that about a third had random sets of lowercase characters replaced by the box (no character) symbol.

I did the obvious thing: I tried printing lots of documents from other programs. No problem. Only FileMaker seemed to have difficulties. Worse still, the second time I tried to print, FileMaker began complaining that no printer was chosen. I tried opening Chooser, but all I got was a beep (in MultiFinder, that usually means there isn't enough memory to load the DA, but a check of About the Finder showed that I had several megabytes free). Something was mighty screwy here.

Since the problem could be solved simply by restarting the Mac and reprinting the problem invoices, I decided to just ignore it for a while. So I went about my usual business and suffered occasional and unpredictable print problems. Other applications eventually started showing weird little idiosyncrasies: Page-Maker quit unexpectedly while printing; DAs wouldn't load; sometimes the system wouldn't boot the first time; and every now and then — at exactly the wrong moment, it seemed — the computer would do something major league, such as crash, bomb, or freeze.

I was really puzzled. Surely it couldn't be the HP Desk Writer. It obviously wasn't ATM, which others were raving about. Whatever the problem, it was driving me crazy. I started to dread sitting down to work at my Mac. I'm told I yelled at it several times, banged on my desk like Khrushchev, and generally ragged on

anyone unlucky enough to walk by my office to see how I was doing. (Some might say this behavior merely reflects how grumpy I am when I'm working. But my close friends tell me I was even grumpier than usual.)

OK, it was time for a major restructuring. Out came the 19-inch monitor and accelerated 24-bit-color cards. Out came all the INITs and cdevs. Out came all guestionable software. Out came ATM. Out came the DeskWriter. I was mad. I was going to strip my machine right back to its old, slow, unexpanded self. I'd just box everything

up, make a heap in the driveway, and have a bonfire. I'd do anything to get my system back to normal.

I booted the stripped-down machine, and—oh no! I was still having problems! What the . . . wait just a second here. I was using the same System Folder that had worked perfectly for months prior to the upgrade madness. Maybe my Mac was getting ready to go south for the winter. Although I coveted a new Macintosh IIci, I didn't really want to have to write a check for one (and no, Apple doesn't give us columnists a break on price, either—and the last time anyone from Apple called to ask if I wanted to review something was more than two years ago).

I noticed that there was still one minor difference between my old, stable system and my current nightmare: the hard-disk drive. I couldn't believe that the driver for the Rodime hard disk would cause problems, but maybe the partitioning software would. After all, the BBSs are full of messages from people who've had problems with partitioning software. So the next step was to back up my hard-disk partitions onto Bernoulli cartridges, re-

Do As We Say, Not As We Do

The following quotation is from Apple's *Macintosh Technical Note*, "#227: Toolbox Karma."

It is getting increasingly difficult to make additions to the Macintosh Toolbox. The single greatest obstacle today is compatibility. Often, engineering is prevented from doing something in an elegant manner because it would break some applications....

ner because it would break some applications You're probably thinking, "But I followed the rules." You're right. You've followed the stated guidelines in Inside Macintosh and the Macintosh Technical Notes. You've done nothing explicitly wrong.

However, you can do *more* than just follow the rules . . . Understand that by taking advantage of a documented feature, you may be preventing the Macintosh from growing in the future

By going beyond the guidelines in *Inside Macintosh* and the Macintosh Technical Notes and considering the effects of your design decisions on the whole Macintosh community, you allow the Macintosh to grow and change while still maintaining compatibility.

In other words, Apple tells developers that if they don't follow the rules, future System releases will break their applications. On the other hand, if developers do follow the rules, Apple can't grow.

format the hard disk, and start over without partitions.

And the problems got worse. The system crashed repeatedly as I tried to perform Finder copies of files from a partition to a cartridge. This was getting scary

— I couldn't even back up my system.

Fortunately, I already had backups of most of my work. I copied the few files I hadn't backed up one at a time to a cartridge. Then I reformatted everything. This time, I decided to leave out the partitions. I copied all of my files back from the cartridges to the Rodime drive and gingerly tried a few pieces of software. They worked! I added my INITs and cdevs. They worked! I added the DeskWriter driver and ATM. They worked! I tried backing up to cartridges. It worked! I printed invoices from FileMaker. It worked! Everything worked!

The Fatal Floppy

When — in a voice of awe — I described this whole perplexing process to my partner Kurt, he did the old "Oh yeah, you probably ran into the . . ." routine. Two months of living with a finicky, buggy system, and now someone's tell-

POWER TOOLS

ing me that my problem was a predictable one? Maybe it really was. It seems that the Macintosh system software doesn't do too well with eight or more volumes on the desktop. I had partitioned the Rodime into five volumes. (Doesn't that seem reasonable? After all, I had 210 megabytes to divvy up.) My older drive represented a sixth volume, and the Bernoulli added two more volumes (the seventh and eighth, which might explain why I was having troubles backing up to

the cartridges). Insert a floppy, and I was over the limit (and yes, I deal with floppies every day).

Indeed, looking back at my problems, I could see how errant handles and memory management in the System Heap (where the volume information is kept) could have resulted in *all* the symptoms I noted.

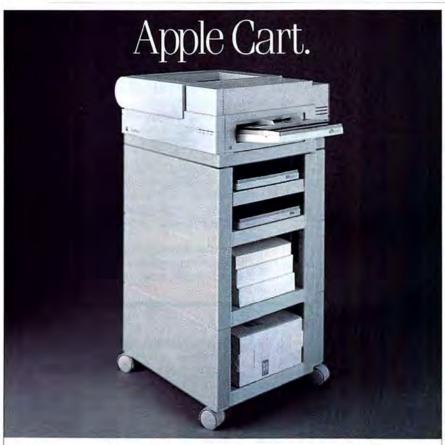
Of course, the sort of problem I experienced is just one in a long line of troubles we Mac pioneers have had (I got my first Mac in 1983 as a certified developer and fell in love with it immediately, despite its quirks). It all began with programs that almost worked, but didn't quite-usually because the authors didn't yet know how to program the machine (remember Habadex?). Then there was the switch to the LaserWriter, which seemed to make every existing Mac program stop printing. And then hard disks through the serial port, the Mac Plus and the new ROMs, MultiFinder, Color QuickDraw, System 6.0. Each new incremental change in the Macintosh design and operating system has brought new troubles to look out for.

We can't really blame Apple for (most of) our troubles. The Mac is at the leading edge of what is happening in computerdom. There's an old saying: Those who live on the leading edge will eventually be cut by it.

Let's face it: The Mac is temperamental. Not quite as unreliable as an older Alfa Romeo or MGB, perhaps, but certainly quirkier than we'd like it to be. Sure, a Mac Plus running System 4.2 on an Apple 20-megabyte hard drive is reliable (assuming you don't get stung by video-board/power-supply death), as long as you're satisfied with the software you're using and don't try to update to the latest, greatest version.

But for those of us who must keep up with the next release of virtually everything, life is going to become much more difficult in the near future. Between 32-bit QuickDraw, System 7, multimedia boards, virtual memory, Excel 3.0, hundreds of new INITs and DAs, and a neverending list of other new goodies, the combinations and permutations of things that can go wrong are nearly endless. Dare I mention the upcoming Motorola 68040 CPU chip?

(From the standpoint of a software developer, things are getting out of hand. Just how many configurations must we test before we can feel reasonably certain



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that the vast majority of users will never have a problem?)

The issue that's about to become a major one is that of responsibility. When Apple changed to the new color Laser-Writer drivers, a program that my company was developing stopped printing on some machines. Unfortunately, it was our problem - we had an errant routine that didn't check to see what data structure it was updating and was overwriting memory it shouldn't have. Then along came Excel 2.2, and my company's program stopped working again - this version of Excel sometime stops reading files when it sees a null character in the text (previous versions ignored nulls). That's not our problem; it's Microsoft's. OK, these are clear-cut cases and easy enough to verify.

But what about the drive-partitioning problem I had? Whose fault was that? Rodime's? Apple's? Mine? It's easy to imagine what the HP or Adobe folks would have said if I had called their support lines. "You say your DeskWriter is printing boxes every once in a while instead of lowercase characters? What System are you using? Are you sure you installed the driver correctly? Did you try taking out the INITs? You did all this? Well, you've got me stumped"

And who should I have called when the Radius installation didn't work? Is it Radius' or Orchid's responsibility to test the use of the two pieces together? (This is where good dealers earn their living. If you've ever wondered why Businessland, for example, sells only certain combinations of equipment from a few selected vendors, you can probably now guess why. Resellers don't want to get into a situation where they have to spend hours trying to track down a user's problem — that doesn't make them any money.)

I bought my Macintosh to have more control over my work and be more productive, and I suspect that you bought yours for the same reason. I certainly don't want to spend weeks tracking down bugs and intermittent flakiness every time I use an update of a software product or install a new printer.

But that's what lies ahead, folks. When System 7 finally appears, the problems I've described here will probably seem trivial in comparison. It'll probably take a couple of months to get my system stable again.

I'm starting to think I should set up a

permanent, reliable system for use in my everyday work, and then have an experimental machine for testing new software and hardware. It might be a waste of equipment — but it would certainly do a lot for my sanity. You see, now that my

computer is working again, I reinstalled the Orchid MacSprint II card. Guess what? Yup. It wouldn't work until I took 32-bit QuickDraw out of my System Folder. And then I decided to try that new version of

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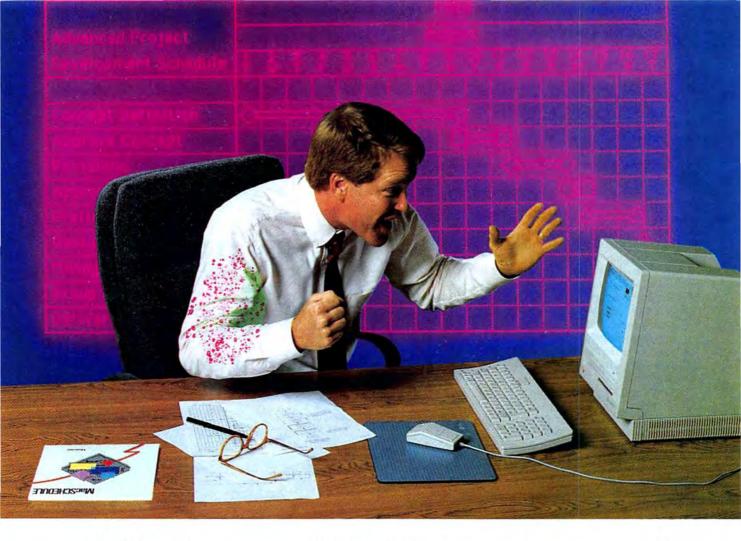
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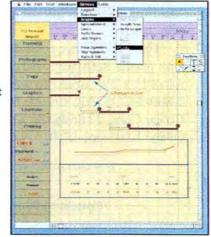
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Environmental Awareness

The sooner you master the THINK C programming environment, the sooner you can start writing great programs.

elcome back. This month we're going to explore the THINK C programming environment, which you'll be using to write a simple application. We hope you've made a good start on the homework we suggested last month, because next time we'll jump right in and create a real Macintosh equivalent of Kernighan and Ritchie's well-known first-time

All the Hello World program does is write a message to the computer's screen. There are easy ways to emulate that simple example, but they wouldn't teach you anything about the idiosyncrasies of programming on the Mac. Our version of Hello World will have the added challenges of initializing the Macintosh Toolbox, building the proper interface components

programmer's example, Hello World.

(such as a menu and a window), and then displaying the message in the window.

Although the Hello World example might seem less than thrilling, it will serve a couple of important functions. First, because it's a real, complete program, we'll be able to show you the complete development process. Second, much of what you'll learn from Hello World will be directly applicable to other Macintosh programs. All Mac programs must initialize the ROM tool kit; all Mac programs must provide basic interface-handling components, such as windows, menus, and dialog boxes. Hello World will allow us to concentrate on these important aspects without burying you in application-specific information.

Programming in THINK C

But before we can introduce you to Hello World, an orientation tour of THINK C's pro-

> gramming environment is in order. What do we mean by a programming environment? It's an integrated package: You edit, compile, link, and run your program without leaving the environment's application. And, under MultiFinder with at least 2 megabytes of memory, you can also use the THINK C Debugger to trace execution of your program, following it step by step to see what it does at each point in your source code.

Developf THINK C f GenApp f GenApp T GenApp T GenApp T GenApp T GenApp T GenApp T GenApp T GenApp Sources GenApp Headers Figure 1: How to organize THINK C files on your hard disk.

By Thom Hogan and Kurt W.G. Matthies

The THINK C Folder

Version 4.0 of THINK C comes on four distribution disks that contain nearly 400 files. Those of you with limited hard-disk space will be relieved Those beautiful ideas in your head need to go on the overhead just as beautifully, but your artistic ability or the guy in graphics just won't cooperate.

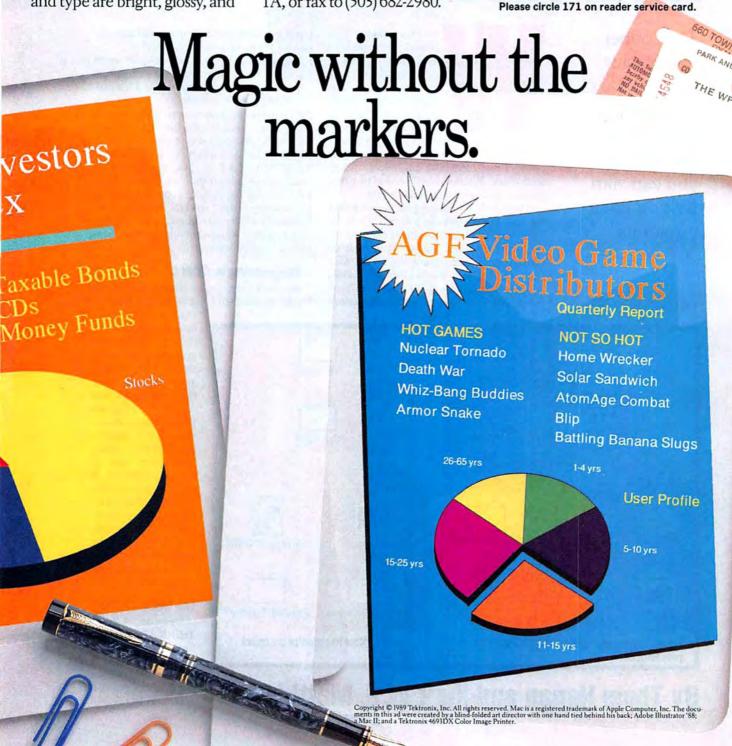
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to learn that you don't need to copy all those files onto your hard disk. The sidebar "THINK C Disk Organization" describes how to organize your folders.

The two most important files are the applications called THINK C and THINK C Debugger. The former is the integrated programming environment, and the latter is THINK C's debugger. You'll also be using the libraries and header files. The other files shipped with your copy of THINK C are useful but not absolutely necessary — they contain sample projects and program utilities.

Programming Libraries

Let's start with the libraries. Libraries are collections; for example, a medical library is a collection of materials about medicine. A programming library is an organized collection of program pieces. You can access these pieces, called functions, from any application that incorporates, or links, the library. The THINK C environment has a built-in linker for this purpose.

The functions in a library are in compiled, or machine-readable, form. That means that you can't see how they were created unless you have access to the original source code, which usually isn't available, or, given a commercial library, is available for a price. We salute Symantec, the publisher of THINK C, for including the source code for the UNIX and standard C libraries with the package. Look for a folder called Sources inside a folder called C Libraries on your distribution disks and add it to your THINK C folder.

Why limit access to the source code? Library code is (usually) thoroughly debugged. That's why compiled libraries contribute to software reliability. If you modify the proven source code in the library, you might create new bugs.

The functions of a programming library must have complete, descriptive documentation of their name, action, inputs, and outputs. The inputs to a function are called its *parameters* or, informally, *arguments*. The output of a function is known as its *return value*. All this information about library functions is collected in the *Standard Libraries Reference* manual.

The Standard Libraries Reference

The style of the entries in THINK C's Standard Libraries Reference manual is borrowed from the original UNIX documentation, which is where C library-function documentation first appeared. The entries are usually one function to a page, with four main sections for each entry. (Note: We'll be referring here to the manual for version 4.0 of THINK C; other versions may look a little different.)

The function's name is listed at the top of each page. Then comes the library that the function belongs to (in this case, ANSI).

The next line describes the syntax. For example, the function toupper() is listed like this:

#include <ctype.h>
int toupper (int c);

The first line tells us that we need to include the file ctype.h to use this function. The .h indicates that this is a header file. (We'll get to header files in a moment.) The second line tells us that toupper() accepts an integer argument and returns an integer, which gives us enough information to use this function (see Figure 3).

The most important section of a library-reference entry is the description, which tells you what the function does. The manual says, "toupper() converts a lowercase letter to the corresponding uppercase letter," so you know that toupper() transforms any lowercase letter into its uppercase equivalent.

If the function returns a value, the Returns section describes the error value or range of data values you can expect.

The Standard Libraries Reference manual is also organized by library. THINK C comes with several different libraries — exactly which ones depends on the compiler version you own. Here's what you need to know about them:

MacTraps (versions 3.0 and 4.0): This is the most important library that comes with THINK C, because it contains all the references for the Macintosh Toolbox routines. (These are the pieces of code needed to access the functions built into the Mac's ROM, such as management of windows, menus, and printing.) Any program that uses a Toolbox function needs to link with the MacTraps library. In other words, virtually any program you write needs to link with MacTraps.

ANSI (version 4.0 only): ANSI (American National Standards Institute) has a committee on C, and for years it's been actively attempting to standardize the language. Since one of C's biggest assets is its portability from one platform to

C programmers use header files to define constants, macros, data structures, variable declarations, and function prototypes.

THINK C Disk Organization

If you haven't already done so, create a folder on your disk called Developf, and within this folder, create a folder called THINK Cf (type Option-f to create that f character; it's a handy way to distinguish folder names from filenames).

Place these files and folders from the distribution disk into THINK Cf: THINK C, THINK C Debugger, Mac-Headers, Mac #includes, Mac Libraries, and C Libraries. That's a bare minimum. You can also copy any other folders that you might find interesting. Agood candidate is the Library Sources folder. Figure 1 shows the organization of THINK Cf.

Some of the sample projects that Symantec supplies are good for getting started. If you want to include them, though, don't place them in the THINK Of folder; place them one level higher, in Developf. Other file folders in Developf should be independent projects, programming libraries, or other developer tools.

Figure 2 shows the organization of a folder for an application called GenApp. The GenAppf folder contains the project file (GenApp. π), the resource file (GenApp. π .rsrc), a folder for the C-language source files (GenApp Sources), and a folder for the header files (GenApp Headers). C programmers use the π symbol (Option-p) to distinguish the project GenApp from the actual GenApp application.



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another, such standardization is important. The functions in this library were designed to make THINK C more compatible with ANSI's standard.

stdio (version 3.0 only): If you've read Kernighan and Ritchie's book, or if you're migrating to the Mac from a DOS or UNIX environment, you'll expect the standard C functions to be supported by THINK C. All the I/O functions (input and output), including printf(), filestream utilities, and character-I/O primitives, are contained in this library.

math (versions 3.0 and 4.0): If you plan to use the C mathematical functions, such as the square-root, trigonometric, or logarithmic functions, you need to add the math library.

unix (versions 3.0 and 4.0): The unix library is provided to aid developers who are porting UNIX applications. Some of the functions don't do anything setpid(), for example, is provided just for compatibility. We've never needed to use this library, and unless your thinking is steeped in the UNIX tradition, you won't either.

As you can see, you have a variety of choices with libraries. Hello World requires only the MacTraps library. As we progress, our projects will be using more of the Symantec-supplied libraries.

Header (Include) Files

C programmers use header files to define constants, macros, data structures, variable declarations, and function prototypes. A single header file is usually included by multiple source files, so it's easier to affix a definition to one particular file in your project. Defining something such as a constant's value in only one place makes good sense organizationally - if you need to change the value later, you have to do it only once. As your programs become larger and more complex - perhaps encompassing

upperC, c;

dozens of source-code files - the importance of properly maintaining header files increases.

THINK C comes with many header files, which are organized by Toolbox Manager, just as the Inside Macintosh books are. For example, Event Manager constants and structures are defined in EventMgr.h, QuickDraw stuff in QuickDraw.h, and Window Manager structures in WindowMgr.h. Most of the widely used structures, such as Point, Rect, Handle, Boolean, or Size, are defined in MacTypes.h, so you'll have to include this file for most projects.

A note about the syntax of include statements: When the compiler sees double quotes around a file's name, as in #include "constants.h" it searches the current project folder and any folders inside that folder, looking for the file constants.h. Conversely, when the compiler finds angled brackets, as in #include <QuickDraw.h>it looks for the file in the THINK C folder. The angle brackets signify that the file is a "system" include and resides in the THINK Chierarchy. The way we've told you to set up your files necessitates that you use the second form.

MacHeaders

Inside Macintosh is your guide to what headers to include. If you're using the Window Manager and accessing a WindowRecord data structure, you'll need to include <WindowMgr.h> for the structure definition. One problem with this way of doing things is the number of files you'll need to remember to include when developing most applications - the compiler's syntax-checking error messages get to be pretty annoying until you come up with the right combination.

Beginning with version 3.0, Symantec has come up with an elegant solution to this problem: precompiled headers. The precompiled headers file supplied with THINK C, MacHeaders, contains definitions for most of the commonly used managers. The file is in binary form, unlike conventional header files, and so it loads quickly during compiling. What's more, you get the convenience of never having to load a manager include file the file is included automatically in every project with a compiler option. You invoke this feature as a Code Generation option by selecting it in the Options dialog box from THINK C's Edit menu.

The Project Folder

It's a good idea to keep all relevant files for each programming project in their own folder, called the project folder. A typical THINK C project folder contains four distinct types of files:

- · The project file.
- C-language source files, called .c
- · C-language header files, called . h or include files.
 - The project resource file.

The project file is the master file for the project. It contains everything THINK C needs to construct the application from your source files. All project management is done from this file. Once you open the project file, a list of the source files appears in the project window. You open the source files by double-clicking on their names. The Full Titles option (on the Window menu) is useful when you have more than one version of the source code on disk. It displays the file's path in the window title.

For program building, THINK C has a built-in, UNIX-like Make facility (when we say UNIX-like, we mean in essence, certainly not in appearance). This facility automatically keeps track of compilation dates and dependency information for your source files. When you change a file, the date and time are internally noted,

```
Figure 3
#include <ctype.h> /* include at the top of the source file */
myFunction()
```

```
/* declare inside of one of our functions */
upperC = toupper (c);
                           /* convert the character */
```

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so when you try to run the program, THINK C reminds you that the project needs to be brought up-to-date. You can also configure the environment to build the program automatically before you run it.

The project file holds the object code (machine-language instructions) that is compiled from the source files. (Some of you may have wondered where the .o files were.) It contains other data such as symbol and line-number tables for debugging and linking, and code-resource-segmentation data. You can imagine how this file might grow to be quite large. In future columns, we'll show you how to use precompiled headers to reduce the size of your project file. For the time being, though, you won't have to worry about taking up too much space.

A note on disk organization: It's tidier if you minimize the number of files in a folder. So when a project acquires more than four or five source modules (.c files), subdivide the project folder into a source-file folder and an include-file

folder to hold all the header files.

The .c or .h suffix in these filenames is a holdover from UNIX days. Because the Macintosh system-software designers chose to implement a free-form filename, you usually don't have to suffer through names like ACCNTS09.DBF, as your MS-DOS counterparts do. On the Mac, there's no need for a filename extension, the tail that classifies the file. The Finder carries the file's origin internally, so you don't need something such as .DBF to tell you that you're looking at a dBASE file; the icon tells you that.

Unfortunately, source filenames in a development environment are a different story. C source filenames must end with a .c extension — that's how THINK C recognizes them as source files. Likewise, header filenames must always end with .h. It's a throwback, admittedly, but that's the way it is.

The final item you might find in the project folder is the project resource file (although this month's project doesn't require one). We'll talk about resources

The project file holds the object code that is compiled from the source files.

in more detail when we get to building a full-fledged application.

You now should be ready to develop in your THINK C environment. Unfortunately, we've used up our monthly allotment of space. Next month we'll jump right into Hello World, so set up your disk and get familiar with your compiler. You might try following the Hello World tutorial in Chapter 3 of the THINK C User's Manual. It demonstrates the easy way to do it. Next month, we'll show you the Macintosh way.





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Help Folder

Answers to Readers' Questions

Side-by-Side

Q. I have a Mac II and a two-page display monitor. Is there any word-processing utility that will let me see successive pages side by side (like the pages in a book) instead of up and down (like fanfold computer paper)?

John Black Lee New Canaan, CT

A. You ask if there's anything that lets you see successive pages side by side. The answer is yes — Microsoft Word 4.0 has a Print Preview feature that lets you view (but not edit) your pages side by side.

If what you really want to do is *edit* pages side by side, you'll have to invest in a page-layout program. No word processor has this feature; you'll need something along the lines of PageMaker or Ready,Set,Go!.

Help for Radio

Q. I've been searching (so far unsuccessfully) for radio-broadcasting software that runs on a Mac SE. I need a program that can generate daily radio-broadcast logs, keep track of network feeds, schedule commercials (or underwriting announcements, since we are a public radio station), do monthly billings and accounts receivable, track available time slots, make projections, and so on.

I'm running out of places to turn to for this information, and if nothing comes up soon, I'll have to design my own. Unfortunately, my schedule and work load won't make that easy. Mark Wozniak WBF0 Buffalo, NY

A. All things considered, you're asking for a lot — we couldn't find an application that does even part of what you're looking for.

From what you've described, designing your own application would be a huge undertaking. Unless you're extremely proficient with one of the relational-database products (4th Dimension, FoxBASE+/Mac, Omnis, and the like), you should consider hiring an expert in database programming.

ACIUS (10351 Bubb Road, Cupertino, CA 95014; [408] 252-4444), the publisher of 4th Dimension, has an excellent developer directory available for \$10. It lists hundreds of applications written in 4th Dimension and includes the names, addresses, and phone numbers of the developers. If there's something listed that's similar to what you want, contact the developer - it's likely that it could be modified to meet your needs. If not, you could find someone to develop what you need from scratch.

Stormy Weather

Q. Now that another hurricane season is behind us, the saga of Hugo and other seasonal storms reminds us how important a good tracking system is. Hurricanetracking charts are as common as a loaf of bread in homes here in south Florida. As tropical depressions form and move over the ocean, their coordinates are broadcast to the anxious public, who plot them on the charts. What a perfect assignment for the graphic

abilities of the Macintosh!

Mac owners living along either U.S. coastline need a good software program to plot and track tropical storms, whether in the Atlantic or Pacific. Are you aware of any software that will do the job?

John Remensnyder Palm Beach Gardens, FL A. Check out MapMaker (Select Micro Systems, 322 Underhill Ave., Yorktown Heights, NY 10598; [914] 245-4670). Using its included maps, you can plot latitude and longitude points as far as several hundred miles offshore. The program comes with boundary files for the U.S. by state and county, boundary

Vive la Différence

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Figure 1: Version 1.2d2 of ResEdit isn't very userfriendly...

Q. In Tip Sheet (November '89) Gerald H. Raddtz described how to use ResEdit to suppress the day of the week so it won't appear in the date in Word 4.0. An illustration showed what the necessary dialog box looked like. I opened the it/1 window in my System file with ResEdit as instructed but got a different dialog box (see Figure 1) that doesn't give me the option of suppressing the day. I tried again with Systems 6.0.2 and 6.0.3, but it still looked the same. The only difference between Raddtz' method and mine was that I used ResEdit 1.2d2 instead of the version recommended in the tip (1.2).

Richard L. Gibson Gien Eliyn, IL

Figure 2:
... while
version 1.2
makes
suppressing
the day of
the week
easy.

	mes for months	Names for days	
Januarq	July	Sunday	
February	August	Monday Tuesday Wednesday	
March	September		
April	October		
		Thursday	
May	November	Friday Saturday	
June	December		
Dey	, Month Date	. Year	
_		Leading D in Dat Suppress Date Suppress Pay Suppress Month	

A. The "only difference," the version of ResEdit you used, turns out to be a significant one: Versions with letter/number suffixes (such as d2 and b3) are development or beta-test versions and may contain features and dialog boxes different from those in the final version.

Use version 1.2 instead of 1.2d2, and the dialog box will look the way it should (see Figure 2).

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files for the world, and a wide variety of population-statistic files. If you want to create a custom map, you can generate your own either by hand or from scanned images. Finally, MapMaker supports Image-Writers, LaserWriters, plotters, and ink-jet printers.

You'll find a complete review in the December '88 MacUser.

Excel 2.2 Steps out of Line

Q. I'd like to call attention to the incompatibility of two outstanding programs: Excel 2.2 and Berkeley System Designs' Stepping Out II. Some of Excel's keyboard commands and especially the Page Preview no longer work when you use Stepping Out II.

Do you know of any tricks or have you heard of any forthcoming solutions for getting Page Preview to work right?

Earl Gardner Redmond, WA

A. Let's look at your problems one at a time. First, the keyboard commands: Stepping Out II's are user-configurable. If you are experiencing a conflict, select Stepping Out II in the Control Panel and click on the Custom button. You can then change any keyboard commands that conflict with Excel's.

As for Page Preview, Excel is doing what it thinks is right. Excel thinks it's drawing your preview on a large screen and consequently places the Page Preview image at the center of whatever virtual screen you've selected; Stepping Out II is

A Special Form

Q. In 1987, the IRS began requiring those of us responsible for the closing of a transaction to report real estate sales. As an attorney whose practice consists largely of performing such escrows, I must report all my closings.

Before switching to the Mac, I was able to find MS-DOS software for doing the 1099-S. I'm having a tough time finding such a program for the Mac, though. It seems that this is a special IRS form that isn't contained in many of the "stock" tax packages.

Cristian E. Anderson

Spokane, WA

A. You're in luck. Heizer Software (Box 232019, Pleasant Hill, CA 94523; [800] 888-7667 or [415] 943-7667) can help you. Heizer offers a sizable catalog of custom templates, databases, macros, and tutorials for Microsoft Excel, Works, HyperCard, and SuperCard. One of the macros it offers for Excel is called Form 1099 Printer. Although the off-the-shelf version of that macro is not designed to handle a 1099-S, the company will be happy to modify it for a modest fee.

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Liaison—recipient of the 1989 Eddy for Best New Networking Product and the only five mouse network product review, "Robust security... Works every time... A brilliant piece of programming... Look to Liaison first." MacUser, April 1989

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Macworld / September 1988

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MACazine / March 1989

"I don't know of any other Mac accounting software which contains so many features and modules for the price."

Computers in Accounting / January 1989

"A welcome and impressive bonus is the Payroll program which can be linked to MultiLedger.... MultiLedger and Payroll are a bargain for companies that don't need a networked system."

MacUser / April 1989

"Our favorite package was MultiLedger.... it's the most elegant, usable and Mac-like of all the packages we reviewed.... CheckMark offers unlimited free telephone support to all users. This policy would lead to bankruptcy if the program were as confusing as others."

The Macintosh Buyer's Guide / Spring 1989

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not to blame. There are two things you might try if you're not happy with this. If you'd like to see a Page Preview the size of your actual screen (not the virtual screen Stepping Out II has created), use the Control Panel to turn off Stepping Out II before you select Print and enter Excel's Page Preview mode. Another option is to use Stepping Out II's Reduce command to get a 50-percent reduction of your Page Preview. Press Command-Option-space bar, and see if that helps.

Batteries Not Included

Q. The internal clock on my Mac Plus doesn't keep time properly anymore, and the Chooser regularly loses track of which printer I've selected.

Everything else still seems

to work, but having the clock and Chooser broken has me worried. Is this a sign that something more important is about to go wrong with my Mac?

Scott Wolf Wheeling, IL

A. It's nothing major; you just need a new battery for your Mac.

The clock and Chooser settings are stored in a special area of RAM called PRAM (parameter RAM) and are maintained by a battery when your Macintosh is turned off. It sounds as if yours has run down and needs to be replaced. On a Plus, the battery is inside the little rectangular "door" on the back of your Macintosh. You can get a replacement from your Apple dealer, or use an Eveready 523 or its equivalent.

Get Info to Stay

Q. I've heard that it's a good idea to rebuild my desktop occasionally by holding down the Command and Option keys when I turn on my Mac. I tried it, and my computer seems to run a little faster, but all the comments in the little box that appears when I select Get Info for a file have disappeared.

I frequently use this feature to make notes to myself — is there any way to bring them back?

Frederick Ayla Westlake Village, CA

A. There's good news and bad news. The bad news is that rebuilding your desktop (which you should do occasionally — the desktop is a poor housekeeper and needs rebuilding every so often to keep it tidy) deletes the Get Info comments permanently.

The good news is that DiskTop (CE Software, 1854 Fuller Road, P.O. Box 65580, West Des Moines, IA 50265; [515] 224-1995) has a feature called CE Comments that lets you rebuild your desktop without losing the Get Info comments.



Nisus. The word heard around the world.

Sang Chaul Shin: Software Engineer, Seoul, Korea Business: Elex Computer, Inc. Word Processor: Nisus™

I like the Nisus word processor very much. Many others must like it too, because Nisus will be supplied with every new Macintosh sold in Korea.

Nisus is replacing the word processors Koreans use now because it is so powerful. Desktop publishers and business people really like it. There are many menus so you can be complicated or easy.

The macros and Easy Grep are especially good because Koreans like to have as many functions as possible. Another thing Koreans like is the graphic support. With MS Word, there was no support. Nisus puts graphics right in the text.

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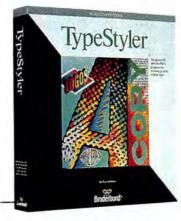
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True Colors

If you create color publications, you've probably experienced one of the most frustrating aspects of color desktop publishing - the lack of WYSIWYG color. The color you see on-screen rarely matches what shows up in print. And the same color looks different on different monitors. Although 100-percent WYSIWYG is impossible - the monitor can't display some colors that can be printed, and vice versa - several companies are making strides in this area.

Radius is marketing the PrecisionColor Calibrator, which is a combination of

systems seem stable once they're on an hour or so. So far, the \$695 Calibrator works only with Radius setups and Apple's 8-bit-color system; the company may add support for other display systems in the future.

Radius and Pantone are jointly developing the Pantone Color Resource, a software technology that will standardize the way the applications implement and

display Pantone Color simulations.

Right now, for example, Page-Maker and Quark XPress generate Pantone colors that have different RGB values, and thus look different on-screen. Radius, 1710 Fortune Drive, San Jose, CA 95131; (408) 434-1010.

The first firm to address color calibration was Barco, which introduced its 19-inch Calibrator monitor last summer. The \$6,700 unit works with several video cards, including those from Radius, RasterOps, and SuperMac. The Calibrator is aimed at the

high-end prepress market, and has a microprocessor that controls all visual elements, including sharpness, geometry, and color quality. Colors are calibrated with the Optisense (\$695), a sensor that attaches to the screen with a suction cup. Color accuracy is tied to CIE standards rather than Pantone colors, and the monitor's electronics automatically compensate for various forms of color drift. You can specify calibration for both the color temperature and the luminance. Barco Industries, 472 Amherst St., Nashua, NH 03063; (603) 880-1430.

RasterOps has repackaged the Barco monitor and Optisense as the RasterOps Calibrator (\$8,650). Add one of Raster-Ops' ColorBoards for an even more upscale solution (\$10,245 with the 8-bit board or \$13,845 for the 24-bit system). RasterOps, 2500 Walsh Ave., Santa Clara, CA 95051; (408) 562-4200.

A third player, Tektronix, is using soft-

ware to solve the problem of WYSIWYG color. Its new color-fidelity system, TekColor, helps you choose screen colors that have exact matches on your printer. TekColor is a cdev and it comes with a database for each supported monitor and printer. The TekColor Picker trans-

parently replaces the Apple Color Picker and shows which colors can be both displayed and printed. (If you have a 24-bit board, you can get a smoother display by Option-clicking outside the dialog box.) When you press Print while working within an application, TekColor intercepts the data and does color adjustments on the fly, matching the output to the screen colors.

TekColor is based on Tektronix's TekHVC (hue-

value-chroma) color model, which in turn is derived from the CIE color standard. Graphics Printing and Imaging Division, Box 1000, Mail Station 63-630, Wilsonville, OR 97070; (800) 835-6100.

calibrating color displays with printed color output.

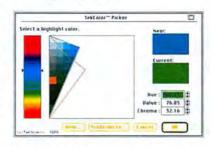
Four firms

provide

products for

Tektronix hopes to get TekColor adopted as an industry standard for color fidelity, so TekColor has an open interface and the specifications are available without charge to other vendors. TekColor (\$50) currently works with four display systems: the Apple color monitor, Radius Color Display, E-Machines T19, and RasterOps ColorBoard 224. For output, TekColor so far works only with Tektronix's ColorQuick ink-jet printer, but the firm plans to add support for its thermal-transfer printers. Tektronix,

- Aileen Abernathy



The TekColor Picker replaces the standard Apple Color Picker. To match colors between monitor and printer, you select a color from the area that is common to both the monitor leaf (in color) and the printer leaf (outlined in red). As you move up and down the hue bar (left), the leaf shapes change, indicating the colors each can access.



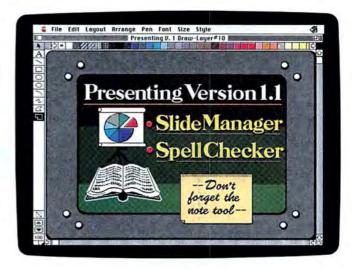
The Radius PrecisionColor Calibrator calibrates the screen colors of Radius and Apple monitors to match Pantone colors.

optical-sensing hardware and proprietary software. The Calibrator, an ADB device that attaches to the

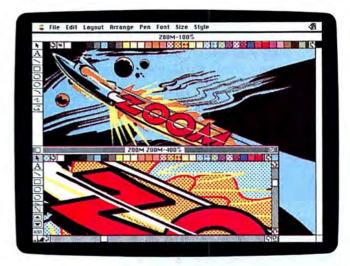
screen with a suction cup, measures the output of red, green, and blue light and provides feedback to the PrecisionColor software, which adjusts the color temperature and tonal (gamma) settings to achieve accurate Pantone Color simulations. Calibration takes about three minutes and provides Pantone screen colors that are reasonable approximations of their printed counterparts.

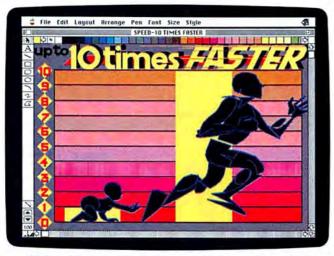
You can adjust gamma settings to improve the display of scanned images, and the color-temperature control lets you compensate for changes in ambient light or differences between monitors. It's too early to say how frequently you'll have to recalibrate your display, but most













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Set in Their Grays

Here's a little experiment: Using a variety of programs, try printing a series of squares, each with a different percentage of gray fill. When you lay the results side by side, you may find some disturbing discrepancies in gray tones. For example, a 10-percent gray in PageMaker or FreeHand printed to a LaserWriter is much lighter than the same shade in Word, Illustrator 88, Ready, Set, Go!, or most other programs printed to a LaserWriter. Actually, the Aldus applications are producing a "true" 10-percent gray; the grays from the other programs are too dark.

Let's say you've drawn a simple square with a 10-percent fill in the original docu-

This draws a 2-inch square filled with 10-percent gray in the upper half of the page. Notice that the gray value is set with a straightforward PostScript command: .9 setgray. Other programs might use 0.9 q (Illustrator 88) or 90.0 PSHADE (PageMaker), but it all

boils down to .9 setgray. When most applications (except for PageMaker and FreeHand) send a 10percent gray to a 300dpi printer, however, the output is actually closer to 30 percent. What gives?

One piece of the puzzle lies within the LaserWriter - in fact, within all 300dpi PostScript print-

ers. They cannot faithfully reproduce a wide range of gray values. Their relatively low resolution limits them to 31

> shades of gray, plus black and white. Therefore, when you request a certain percentage of gray, either in a graphics application or by programming directly in PostScript, you get the printable gray that's closest to what you've specified, not the exact shade that's accessible on a highresolution device. This "rounding error" can cause an approximate 2percent shift in the value of your grays.

> There's another, more significant factor at play - the printer's imaging technology. How big a printer's dots are and how much they spread when they hit the paper also affect gray tones, often making them appear too dark. PostScript has a command, settransfer, that compensates for this effect, but most printer manufacturers don't use this command. Fortunately, some applications do. Aldus products come

with APD files, which optimize output for specific printers. APDs modify the PostScript environment of your printer that relates specifically to gray scales. If you open an APD in a word processor, you'll find a section in the first part of the file called NormalizedTransfer.

NormalizedTransfer redefines the gray-scale mapping so that when you summon a 10-percent gray fill with the PostScript .9 setgray command, the

printer's interpreter is forced to go through some machinations that convert the stated value of . 9 into a value that better approximates a true 10-percent fill. In the case of the LaserWriter, this value is approximately . 97.

The NormalizedTransfer example from Aldus' APD for the LaserWriter

Figure 2 /transarray [0 0 0 1 2 9 10 11 12 13 14 15 16 17 18 20 22 24 26 28 31 34 37 42 44 46 48 49 51 52 54 55 59 60 62 63 65 66 68 69 71 73 74 75 76 78 78 79 81 82 83 83 84 85 85 86 87 87 88 88 89 89 90 90 91 91 92 93 93 94 94 95 95 96 96 97 97 97 97 98 98 98 98 99 99 100 100 100] def (100 mul cvi transarray exch get 100 div) settransfer

Plus is fairly sophisticated programming. But you can create a simpler example that does virtually the same thing (see Figure 2).

> This code takes your setgray value -say . 9 — and multiplies it by 100. The result, 90, is rounded off to an integer if necessary. The code then looks for the 90th value in the table of values (called transarray) and divides that value by 100. In this example, a . 9 returns a value of 97, so the value passed on to the setgray operator is actually . 97.

> You can use this technique with a 300-dpi printer to create grays that approximate grays available from a commercial printer or graphic artist. The technique you use, however, varies from program to program.

> In Word 4.0, you need to type only the transarray procedure into the header window of your document. Place the Word grouping command . dict . at the top of the code, and format the entire block in the Word PostScript style. (For more on Word's PostScript commands, see the DTP section, September '89.) Now the gray fills in your document will print closer to their stated value - for example, when you place a 10-percent screen behind a paragraph.

> What about programs that don't have a ready way to insert PostScript commands? They probably use LaserPrep, so save a PostScript version of your document by holding down Command-K while you click on OK in the Print dialog box. Open the resulting file and insert the transarray

Figure 1

Word

PageMaker

The screens behind these paragraphs were specified as 10-percent gray and printed on a LaserWriter. The Word output is too dark, but PageMaker's is a true 10-percent fill, thanks to some PostScript hijinks by Aldus that compensate for the limitations of 300-dpi printers.

ment. The PostScript code sent to the printer for this square consists mainly of LaserPrep, a collection of PostScript routines and definitions that Apple supplies as part of the system software. After the LaserPrep code, the PostScript code for drawing the box is typically something such as:

144 504 moveto 144 0 rlineto 0 144 rlineto -144 0 rlineto closepath .9 setgray fill



procedure at the end of the LaserPrep portion. A good insertion place is just after md begin. To get the corrected output, you must download this modified PostScript version of your document to a printer that has a utility such as Adobe Downloader or LaserTalk.

To see how closely the gray screens in your favorite program come to perfection, compare the output with what comes out of PageMaker or FreeHand. Aldus' gray fills are correct, so you could use its products as the standards.

One note of caution: Some users report that PageMaker 3.02 doesn't print gray fills as accurately as does version 3.01. Aldus says changing from Aldus Prep to the Apple LaserPrep file solves the problem. The easiest way to print a document with LaserPrep is to hold down the Option key while you choose Print from the File menu. This accesses the standard Print dialog box. You can also switch prep files by using the Change option in the Aldus Print dialog box.

- Gregory Wasson

Dealing with Dingbats

When Apple released the LaserWriter Plus, it included Zapf Dingbats, a Post-Script font of decorative doodads — arrows, stars, flowers, and so on — for adding spice to otherwise drab pages. Zapf Dingbats is now a workhorse font for most desktop publishers. For all its utility and beauty, however, Dingbats has some startling omissions and oddities. Here's a short list of dingbat problems and solutions.

Ballot Box

The preeminent missing dingbat is the plain old ballot box. Granted, there are shaded boxes and an all-black one, but no

simple square exists. Happily, the solution is simple: Use the black box (■) in Outline style. The result is □.

Left Out Wil

In Dingbats, virtually everything points to the right. If you'd like to point to the left, you're stuck with the pedestrian arrows from the Symbol font, ← and ←. Here the solution isn't as obvious as with the ballot box. You must convert the dingbat of your choosing, say the pointing hand (♣a♣), to a graphic and then flip it. Using a graphics program such as Canvas or Cricket Draw, you can do this quite easily. The result appears above. Since PostScript doesn't care which way a font character points, the graphic still prints at the maximum resolution of the printer.

Untypeables

There are three font characters that can't be typed from the Macintosh keyboard. They correspond to ASCII numbers 252, 253, and 254. In the Dingbats font, the missing characters are >>, >>, >>,

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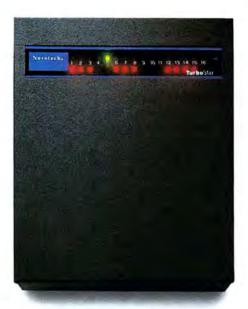
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and ⇒. The font has more than enough arrows already, but if you're determined to access these, use Word's Character Code command, Command-Option-Q. You can then type in the ASCII number of the character you want. When you press Return, the desired character will appear. Using this technique, you can copy the untypeable arrows into the Scrapbook for later use in any application (and in any font).

Command-Key Symbol

Many users are surprised that the Command-key symbol (%) isn't included in the Dingbats font - especially since Apple thoughtfully provides its logo () in the other Laser Writer fonts. In fact, the Command-key symbol is hiding in the Chicago font in another nearly untypeable location: ASCII 17. Only owners of keyboards with Control keys - which excludes you if you own a Mac Plus can type this symbol easily; they can access % by pressing Control-Q. Chicago isn't a PostScript font, so if you need high-quality output, try Chicago Symbols, a shareware PostScript font. (Send \$10 to Bradley Poulson, Northwind Enterprises, 4003 Martin Lane, Two Rivers, WI 54241.) If you own Altsys' Fontographer, you can use the accompanying DemoFont, which also contains the Command-key symbol.

Missing in Action

Eventually you'll need a dingbat that's not in the Zapf collection. What to do then? You can buy Adobe Collector's Edition I, which contains 280 PostScript shapes: circles, squares, crosses, arrows, stars, and so on. They can be used as is or enhanced in FreeHand or Illustrator. You can get this \$125 collection from Adobe Systems, Box 7900, Mountain View, CA 94039; (800) 344-8335.

Another possibility is a shareware Post-Script font called Bill's Dingbats. It has 138 dingbats, including arrows that point in eight directions. This \$8 font is available from U-Design, 201 Ann St., Hartford, CT 06103; (203) 278-3648.

If that doesn't help, start looking through the numerous available picture fonts, such as Cairo and Mobile. Many are freeware or shareware and are available through most on-line services. It's like rummaging through Grandma's attic: You never know what treasures you might find.

Need Texas-style dingbats for your Lone Star newsletter? Check out the Armadillo font from Texan Russ Coffman, which is replete with six armadillos, four state maps, and the Texas flag. (Note that this PostScript font is "beerware" - you have to chug a Lone Star in the author's name if you use it.)

If all else fails, draw the dingbat yourself. A utility called Art Importer (a.k.a. KeyMaster) lets you create an installable PostScript font containing EPSF and/or PICT graphics. The resulting graphic characters can be typed like letters in any other font. This \$99.95 program is available from Altsys, 720 Avenue F, Suite 109, Plano, TX 75074; (214) 424-4888.

- Dave Valiulis

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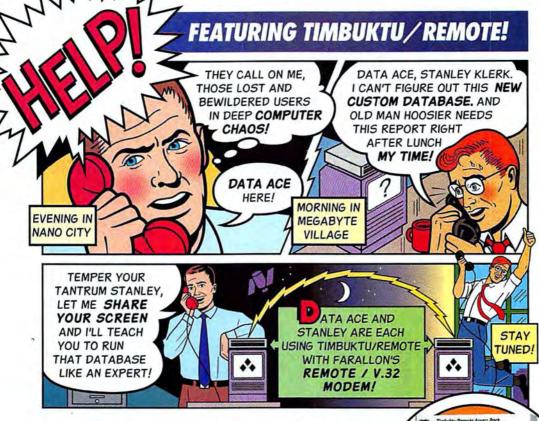
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Currents

Moofing Files

Last month, we discussed Public Folder. a utility provided by Claris for moving files over a network without using Apple-Share or TOPS. Public Folder lets you

designate a folder on your hard disk as "public" so that anyone else on the network who's running Public Folder can retrieve files in your public folder.

Oscar, a utility written by Pete Helme of Apple's Macintosh

Developer Technical Support (MacDTS). does Public Folder one better. While Public Folder only lets you retrieve files from someone else's Mac, Oscar lets you send (but not retrieve) files point-to-point over a network. Oscar is one of the first applications (along with Farallon's Timbuktu 3.0) to use ADSP (Apple Talk Data Stream Protocol), which provides an efficient means of moving large amounts of data, such as files, over a network.

Oscar is an application that runs under MultiFinder in a 225K partition. It creates two main folders: In Box and Out Box. Within the Out Box, it creates a separate folder for each user running Oscar. When you want to send a file to someone, place it in the appropriately named folder. Oscar automatically opens a connection to the destination node and

sends the file in the background. You must be careful to copy rather than move files into an Out Box folder, because Oscar deletes a file once it has been sent. (Hint: To copy files in the Finder rather than moving them, hold down the Option key when dragging the file.) You can tell

Oscar to create "From" folders within the In Box folder, so that you'll know who sent the files that you have

The term moofing for transferring files via Oscar-has become an integral

part of NetWorkShop parlance. The reason for this is one of Oscar's most important features: When a file arrives, not only does Oscar flash the DA menu's Apple icon but it also cries "Moof!" For the uninitiated, Moof! is the sound made by a dogcow, which is MacDTS' mascot (for further information on the dogcow, read Apple's Tech Note #31).

Oscar is on Phil and Dave's Excellent CD: The Release Version, which Apple provides to developers. Unfortunately, even this version of the CD will be available only to developers (who will receive it in the mail). At press time there were no plans for general release. Because Oscar is not a commercial product, you will probably be able to get it only from user groups and on-line services.

Stephan Somogyi



received.

CL/1 Ships at Last!

After nearly two years of promises, Apple finally shipped its CL/1 Server for DEC's VAX/VMS minicomputer systems in December 1989. CL/1 is a database-connectivity language that provides a common means of connecting to and making queries of several different database applications that run on minicomputers and mainframes.

The product is shipping for VAX/VMS minicomputers; Apple plans to ship server software that will support IBM mainframe operating systems and databases in early 1990. The databases supported



on the VAX include Oracle, Informix, Ingres, DEC's Rdb, and Sybase. With the CL/I server software installed on a VAX, users can

query any of these databases by using commands in the CL/1 language rather than having to learn the specific syntax of the query language for each separate database.

Mac applications that support CL/1 on the client (user) side include Full Impact, Wingz, 4th Dimension, Omnis 5,

Net Prophet

AppleTalk 53

Apple has recently revised the Apple-Talk drivers to version 53. AppleTalk 53 implements all the necessary extensions to support AppleTalk Phase 2. One of Phase 1's main problems is that it limits EtherTalk to a maximum of 254 nodes on a single EtherTalk network -Phase 2 lifts this restriction.

Phase 2 also implements a "best router" algorithm for extended networks - that is, for use exclusively by the networks that use Phase 2's extended addressing. Only EtherTalk and TokenTalk networks can be extended networks

A router broadcasts a table of information about itself and all other routers that it knows about on the internet every ten seconds. If a Mac wants to send packets to a node on another network of the internet, the older Apple-Talk drivers will send traffic to the last router it has heard from, even if the router is not on the shortest path to the destination network. Best routing remembers and uses the optimum router to reach the target network.

Users who have networks that are not extended aren't left completely in the lurch, though. The Network Tuner INIT that ships with Liaison, a software router from Infosphere, provides "best" routing for both Phase 1 and LocalTalk

If you are a LocalTalk-only internet, there is no need to install AppleTalk 53. If you have an internet and Liaison, you will probably want to install Liaison's Network Tuner on every node to provide the best routing for everyone. If you have a Phase 2 network, then you need to be running 53 - there are no two ways about this. This will make no perceptible difference to LocalTalk nodes, but the EtherTalk and Token-Talk nodes require it. AppleTalk version 53 comes with all Phase 2 Ether-Talk and TokenTalk products.

If you have a networking question that you'd like answered, let us know. Write to:

Net Prophet c/o MacUser NetWorkShop 950 Tower Lane, 18th Floor Foster City, CA 94404 - Stephan Somogyi



and GeoQuery. Fairfield Software offers Clear Access, a CL/1 query tool, as a DA. Apple also sells a set of HyperCard XCMDs and XFCNs called CL/1 for HyperCard. The CL/1 Server for VAX/ VMS (\$5,000 per CPU or cluster) and a CL/1 Developer's Toolkit (\$695 per user) for Macintosh are available from APDA (Apple Programmer's and Developer's Association).

Apple has announced another goody that many people have been anxiously awaiting: a version of AppleTalk for VMS that will support Phase 2 AppleTalk protocols. When Phase 2 was announced last June, mention of an upgrade to AppleTalk for VMS was conspicuously missing. Without this upgrade, VAX machines—and the AppleShare and print-spooling services that run on them—cannot be put onto Phase 2 networks. As a result, many large AppleTalk sites have been reluctant to migrate to Phase 2. When version 2.1 of AppleTalk for VMS ships in the first quarter of 1990, this barrier will be removed.

Apple has still not announced product details or a release date for the major Mac/VAX network-integration package first promised in February 1988. So we still have something to look forward to.

Henry Bortman

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Everything and the Kitchen Sync

Wide-area networking is a popular way of keeping remote sites closely linked. Until now, high-speed modems used with products such as Shiva's TeleBridge have been closing the gap with relatively low-speed asynchronous connections. Many large companies, however, already have high-speed synchronous lines installed as dedicated links to remote sites.

To enable AppleTalk connections across these synchronous lines, Engage Communications is shipping SyncRouter. This \$1,895 half-router channels communications between two LocalTalk networks via V.35 or RS449 (it also has an RS-232 port); you need a SyncRouter at each end of the synchronous connection. The SyncRouter's RS-232 port supports communication speeds of up to 19.2 kbps (kilobits per second), the other ports allow speeds of up to LocalTalk's 230.4 kbps. The SyncRouter is compatible with Phase 1 and Phase 2 networks.

Synchronous lines are usually dedicated data lines that have a greater bandwidth than ordinary phone lines and that inherently provide simultaneous data flow in both directions. A synchronous router can make a remote site's network appear as close as the Macintosh in the office next to you.

For more information, contact Engage Communications, 756 Marlin Ave., # 4, Foster City, CA 94404; (415) 358-0264.

— Stephan Somogyi

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Business Sense \$\frac{4322}{343} \text{ is an easy-to-use, fully integrated business-accounting package for small-to-medium-sized operations. All accounting operations are performed on one Mac and can't be divided. Includes payroll and budgeting. No custom reports and can't consolidate companies. Version 1.2. Requires 512KE or later and two 800K drives or hard drive. \$495. Monogram Software, 531 Van Ness Ave., Torrance, CA 90501. (213) 533-5120. NCP (Sept '89)

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Insight \$155% is a high-powered accounting program for the small-to-medium-sized business. Modules include Accounts Receivable, Payable, and General Ledger, others are in the works. Requires 512K and hard disk. \$595. (Additional modules now available: Inventory Control, Version 1.01.04. Time Billing, Version 2.01.01. Payroll, Version 1.0. All modules \$695 each) Layered, 529 Main St., Boston, MA 02129. (617) 242-7700. NCP (Dec. 86)

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0074. NCP (Sept '88)

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when a session is over. Version 1,06. Requires 512K and two disk drives. Mac II and MulliFinder friendly, \$199,95. (Version 1.1 now available for \$299,95) North Edge, 239 Western Ave., Essex, MA 01929. (508) 768-7490. NCP (Sept '88) ★'88 Eddy

COMMUNICATIONS

Accu-Weather Forecaster ttt

is a combination communications and meteorological-data-analysis program. Gives access to hourly National Weather Service station reports. Simple maps and charts let you view weather data graphically. Telecommunication mode is optimized to reduce connect-lime costs. Version 1.05. Requires 1 megabyte; one 800K drive; and a 300-, 1,200-, or 2,400-baud Hayes-compatible modern. \$89.95; Accu-Weather Connect Fee, \$39.95; educational and commercial connect rates higher. Metacomet Software, P.O. Box 31337, Hartford, CT 06103, (203) 223-5911. NCP (Aug '89)

Apple File Exchange (AFE) 3333 is one of the utilities that comes free with the Mac System. AFE offers a simple interface and works with a wide variety of data-transfer methods. Its best feature is that it works with current and transier memous, its best leature is that it works with current and future. MacLinkPlus translators. By itself, its translators are limited to MacWrite generic text. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (Oct 89)

Apple PC 5.25 \$\frac{1}{2}\frac

lloppy disks, Unlike most Mac drives, this one doesn't show up on the desktop. Access to DOS files is through Apple File Exchange, Requires a card that occupies an expansion slot in your Mac, Requires Mac SE or NuBus slot. Drive, \$399; board, \$129. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (Oct '89)

AppleShare \$\$\$\$ is the file sharer markeled by Apple. Soltware-based, AppleShare requires you to dedicate a Mac and a hard disk to run it. Allows users on the network to protect things from other users on the folder level. Interface to network is provided at a revised Finder. \$799. (Now available: AppleShare Print Server, Version 2.0, \$299; AppleShare PC, Version 2.0, \$149.) Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. NCP (May '87)

ComServe \$\$\$\$
allows you to share a Hayes-compatible modern over an AppleTalk network. You can call out, but you can't call in. Works with most telecommunications packages. \$195 per server. Infosphere, 4730 S.W. Macadam Ave., Portland, OR 97201. (503) 226-1407. CP (Feb '88)

\$1,005; single drives start at \$550; MacLinkPlus/Dayna, \$125; DOS Mounter (for use with Apple FDHD drives), \$89. Dayna Communications, 50 S. Main St., Fifth Floor, Salt Lake City, UT 84144. (Oct '89)

Desktop Express \$\$\$\%\$ is a simple-to-use, semiautomated program for using MCI Mail and Dow Jones News/Retrieval. Performance is traded off for ease of use. Requires 512K. \$149. Dow Jones & Company, P.O. Box 300, Princeton, NJ 08543-0300. (609) 452-7040. NCP

LapLink Mac \$555 is a file-translation package that runs on the PC and connects to the Mac via a serial cable. Not a bad program as far as DOS goes, but this version has some quirks. The PC-to-Mac translators concentrate on word processors, but there aren't nearly as many as in MacLinkPlus, Version 2.0. \$139.95. Traveling Software, 19310 N. Creek Parkway, Bothell, WA 98011. (Oct '89)

Liaison \$555 is a soltware-based Apple Talk bridge for connecting two Local Talk networks or a Local Talk and an Etner Talk network. Using Liaison with standard moderns, a single user can connect remotely to an AppleTalk network, or two networks can be connected to form a

AppleTalk network, or two networks can be connected to form a wide-area network. Serialized. Version 1.0. \$295. (Version 2.0 now available) Infosphere, 4730 S.W. Macadam Ave., Portland, OR 97201. (503) 226-1407. NCP (April '89)

MacLinkPlus/PC \$1115.

MacLinkPlus/PC \$115.

Ma modem. Translators also work with Apple File Exchang and via modem. Translators also work with Apple File Exchange. Version 3.05. MacLinkPlus/PC, \$195 (with telecommunications); MacLinkPlus/Translators, \$159 (desktop version only); MacLinkPlus/WangVS and MacLinkPlus/WangOIS, \$395 to \$895. DataViz, 35 Corporate Drive, Trumbull, CT 06611.

MacWorkStation \$\$\$\$
is a development environment and communications program that accesses custom mainframe applications through the Macintosh interface. Modular design allows for expandability. Mac II and MultiFinder friendly. Version 3.0, \$2,500 for internal

use license; \$5,000 for commercial use license. (\$100 singleuse license now available) Apple Software Licensing, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. NCP

MicroPhone II tttt/

MicroPhone II \$\$\frac{3}{2}\frac{3}{2}\text{is a high-powered terminal program that's easy enough for novices. Very powerful command language allows full automation of communications if desired. \$295. (Version 2.0 now available) Software Ventures, 2907 Claremont Ave., Suite 220, Berkeley, CA 94705. (415) 644-3232. NCP (Jan '89) *86 Eddy NetWare for Macintosh \$\frac{1}{2}\text{s}\text{allows Macs on LocalTalk or Ethernet networks to connect to a lattice of the control

NetWare file server using AppleShare client software. Difficult PC-based setup and administration. Not recommended for Maconly networks. For those with non-AppleTalk PC networks already attached to NetWare servers: 4 mice. Requires 80286- or 80386-based PC for server, PC for administration, PC LocalTalk card, two PC Ethernet cards, NetWare version 2.15 or later, and AppleShare client software. \$200. (Version 3.15 now available) Novell, 122 E. 1700 S., Provo, UT 84606. (800) 526-5463. NCP

pc MACTERM/pcANYWHERE III \$\$\$\$ are two programs that work logether to take control of an MS-DOS machine from the Mac keyboard. Versions: pc MACTERM

DOS machine from the Mac keyboard. Versions: pc MACTERM 1.1; pcANYWHERE III 3.0. Requires 512K; System 4.1 or later; pc MACTERM, \$99; pcANYWHERE III, \$1.45. Dynamic Microprocessor Associates, 60 E. 42nd St., Suite 1100, New York, NY 10165. (212) 687-7115. NCP (Jan '89) QuickShare 2.0 115 NCP (Jan '89) QuickShare 2.0 115 NCP (Jan '89) Gonnects your Mac to a PC using SCSI, enabling a Mac to access files on a PC or PC network. Also gives the Mac disk space on the PCs, which can be mounted on the Mac's desktop and used as Mac disks. File-transfer software provides generic text and graphic translations. Requires DOS3.0 or later. \$465. Compatible Systems. P. O. Drawer 17220. 2900. Center Green Court S.

graphic translations. Requires DOS 3.0 or later. \$465. Compatible Systems, P.O. Drawer 17220, 2900 Center Green Court S., Boulder, CO 80308. (Oct '89)

Rapport/Drive 2.4 \$\$\$\$\frac{4}{2}\$\$\frac{4}{2}\$\$ is a connector/drive combination. When the Rapport connector is attached to the external—disk-drive port of a Mac Plus or SE, it allows MS-DOS 3.5-inch disks to be inserted into the Mac's internal drive and read through Apple File Exchange. Drive 2.4 is an 800K external drive and read through Apple File Exchange. milerial drive and read inrough Apple File Exchange. Unive 2.4 is an 800K external drive that can be used in conjunction with Rapport. Rapport, \$295; Drive 2.4, \$495. Kennect Technology, 120 A Albright Way, Los Gatos, CA 95030. (800) 552-1232 or (408) 370-2866. NCP (July '89)

Red Ryder tttt

is a full-leatured telecommunications program that supports MacBinary, Xmodem, and Kermit. Has big-screen support, auto-procedure creator, and up to 30 keyboard macros. Version 10.3 reviewed. \$80. The FreeSoft Company, 150 Hickory Drive, Beaver Falls, PA 15010. (412) 846-2700. NCP (Jan '89)

Smartcom II \$\$\$\$\$ balances power and ease of use. Capable of unattended operation Datances power and ease of use. Capable of unattended operation and has a powerful command language. The fastest screen updating available can keep up even at 9,600 baud. The large-screen buffer can easily be archived. Version 3.0 reviewed. \$149. Hayes Microcomputer Products, P.O. Box 105203, Atlanta, GA 3034B. (404) 441-1617. NCP (Jan '89) *85 Eddy

SoftPC \$137.

puts an IBM PC X inside your Mac without cacking the case to ded not provided and the state of the state o

add any special coprocessor boards. The emulation of an MS-DOS machine is done entirely in the software, Version 1.2. Requires Mac II or SE equipped with 68020 accelerator card and Requires was not as equipped with 68020 accelerator card and 2 megabytes of RAM. \$595. (Version 1.3 now available for \$399) Insignia Solutions, 254 San Geronimo Way, Sunnyvale, CA 94086. (408) 522-7600. NCP (Nov '88)

is a file server designed to network computers with different operating systems. Supports Macs, MS-DOS compatibles, and operating systems. Supports Macs, MS-DUS companioles, and UNIX. Access to files and subdirectories is transparent to the user; they appear as Mac folders. Only handles ASCII or Text files. \$249 for Mac version. (Version 2.1 now available) TOPS, 950 Marina Village Parkway, Alameda, CA 94501. (800) 445-8677. Serial number protected. (May '87) *87 Eddy VersaTerm-PRO \$355% is a very powerful terminal program with several special features. Does one of the best VT100 emulations available and specializes is birth quality. Textreps: 4014 and 41015 emulation.

in high-quality Tektronix 4014 and 4105 emulation. A pro's tool. Requires 512K. \$295. (Version 3.0 now available) Synergy Software, 2457 Perkiomen Ave., Reading, PA 19606. (215) 779-0522. NCP (Apr '87)

DATABASES

DAtabase \$\$\$\$\\^{\frac{1}{2}}\) is an excellent flat-file manager in a DA. Handles pictures, text, and numbers with ease. Supports color. Converts QuickDEX and other files. Version 1.12. Requires 512K or later. \$129.95. Preferred Publishers, 5100 Poplar Ave., Suite 706, Memphis, TN 38137. (Nov '89)

dBASE Mac 3333 is a relational DBMS that includes a structured programming

language to develop stand-alone applications. Palette icons as alternatives to menu commands will help novice users. Requires 1 megabyte. \$495. (Version 1.01 now available) Ashton-Tate, 6411 Guadalupe Mines Rd., South San Jose, CA 95120. (213) 327-1111. NCP (Feb '88)

Double Helix II \$\$\$\% is a powerful database that supports a multiuser environment with an upgrade. Uses an icon-based development system for easy creation of databases. \$595, single-user version. (Version 3 now available) Odesta, 4084 Commercial Ave., Northbrook, IL 60062. (800) 323-5423. NCP (Apr '88)

EndNote 1111/

provides database management for bibliographies. Designed to work in conjunction with a word processor. Allows for formatted in-text citations to be pasted directly into a word-processing document and then creates a bibliography from the citations. Version 1.0. \$129. (Version 1.2.1 now available) Niles & Associates, 2000 Hearst St., Berkeley, CA 94709. (415) 655-6666, NCP (Feb '89)

Microsoft File 111 is an OK flat-life manager. Biggest strength is its more than 100 forms templates that work with standard preprinted business forms. Version 2.0. Requires Mac 512KE. \$195. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717. (Nov '89)

FileMaker II \$\$\$\$% is a solid development-oriented multiuser flat-file manager. ideal for business environments. Has flexible layouts, hierarchical menus, and good searching and reporting capabilities. Supports color, Version 1.0, Requires Mac Plus and two 800K drives or a hard-disk drive. \$299. Claris, 5201 Patrick Henry Drive, Santa

hard-disk drive. \$299. Claris, \$201 Patrick Henry Drive, Santa Clara. CA 95052-8168. (Nov '89)

Filevision IV \$35
is a picture-oriented flat-file manager. The application of choice for graphics-text integration projects. Doesn't stack up well in straight-text uses. Version 1.0. Requires Mac Plus. \$495.

Marvelin, 3420 Ocean Park Blvd., Suite 3020, Santa Monica, CA 9005. (Nov. '90) 90405. (Nov '89)

4th DIMENSION \$\$\frac{1}{2}\frac{

applications created in the MS-DOS world. Amazingly fast. Good implementation of dBASE on the Mac. Version 1.0. Requires 1 megabyte. Mac II and MultiFinder triendly. \$395. (Version 2.0 now available for \$495. Multiple user: \$695.) Fox Software, 134 N. South Boundary, Perrysburg, OH 43551. (419) 874-0162. NCP (Sept '88) * 88 Eddy

MBA Series \$\frac{1}{3}\frac{1}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{

ACIUS' 4th Dimension. It's also an automated programming environment for developing additional 4th Dimension applications. Requires 1 megabyte and 4th Dimension. \$189 per application, unlimited users. Generation Four, 3232 San Mateo N.E., £199, Albuquerque, NM 87110. (505) 294-3210. NCP (May '89)

Omnis 5 1111

is Blyth's major upgrade of Omnis. Primarily a developer's tool, it's a powerful, graphics-oriented, multiuser relational/hierarchical database. Improved interface still isn't entirely Mac-like. Comes with HyperCard externals for creating HyperCard front ends. Version 1.0. Requires Mac Plus or later and hard drive. \$695. Blyth Software, 2929 Campus Drive, Suite 425, San Mateo, CA 94403. (800) 843-8615 or (800) 223-8050 CA. NCP (Sept '89)

Oracle for Macintosh \$3\$\$
is more a development tool kit than an end-user product and makes possible the creation of Macintosh front-end applications that access Oracle databases on mainframes and minis. Includes HyperCard XCMDs. Version 1.0. Single-user, \$199; network version, \$999. (Version 1.1 now available: Single-user, \$299) Oracle, 20 Davis Drive, Belmont, CA 94002. (800) 345-3267. NCP (June '89)

Panorama \$\$\$\$\$
replaces the flat-file manager OverVUE. Keeps databases in RAM
for speed. Spreadsheellike data entry. Supports text, numbers,
graphics, and dates as data types. Also offers color support,
powerful charting function, and macros. Version 1.1.1. Requires
Mac Plus. \$395. ProVUE Development, 15180 Transistor Lane,
Huntington Beach. CA 92649. (Nov '89)

Pro-Cite \$11% is a complete database-management system for bibliographies. Almost unlimited flexibility in the formalting of bibliographies. Full-featured search and sort capabilities. Version 1.3. Requires 512KE. \$395. Personal Bibliographic Software, P.O. Box 4250, Ann Arbor, MI 48106. (313) 996-1580. NCP (Feb '89)

RecordHolderPlus \$\$\$\$
is a middle-of-the-road flat-file manager with average functionality. Has the best edit functions on the market. Good choice for a high-volume application in which editing can make all the difference. Version 3.1. Requires 512K, \$99.95. Software Discoveries, 137 Krawski Drive, South Windsor, CT 06074. (Nov '89)

Reflex Plus: The Database Manager \$\$\$\$ is a relational database with "smart" entry and report design but

no overall programming facility. Simple to set up, yet fast. Graphic capabilities are quite limited. Version 1.0. \$279. (Version 1.01 now available) Borland International, 1800 Green Hills Rd., Scotts Valley, CA 95066. (800) 345-2888. NCP (Feb '88)

Retriever \$55 is a spreadsheel-oriented DA flat-file manager that has solid reporting and uses icons instead of menus for many functions. Has fast sorting capability, decent searching capability, and HyperCard interface. Version 1.03. Requires 512K. \$89.95. Exodus Software, 8620 Winton Road, Suite 304, Cincinnati, OH 45231. (Nov '89)

DESKTOP PUBLISHING

DTP Advisor \$\$\$
combines a HyperCard-based tutorial on publishing with a project-management system. Beautifully designed but better off as a book. Version 1.0. Requires 1 megabyte and HyperCard 1.2. \$79.95. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101. (415) 492-3200. NCP (Apr '89)

Fast Forms 15: sa forms-design and -management program that uses a DA for forms fill-out. It has only basic calculation ability and a limited design environment. Confusing interface. Version 1.2.1. Requires Mac 512KE, System 3.2, and Finder 5.3. \$149.95. Power Up! Software Corp., 2929 Campus Drive, San Mateo, CA 94403. (Jan '90)

FlexForm Business Templates \$\$\$\$\%

are two volumes of prepackaged business forms. Includes SmartForm Assistant. Volume I contains stockkeeping, production, sales, billing, and collection, Volume II has purchasing, receiving, accounting, disbursing, and personnel. \$89.95 per volume. Antic Software, 544 Second St., San Francisco, CA 94107. (Jan '90)

FontLiner 1113 converts FontQuery 1213 converts FontQuery 1213 converts Fontographer-created typefaces into PostScript outline tonts that can be edited in Illustrator and FreeHand. Version 1.0. Requires 1 megabyte. \$129.95. Taylored Graphics, P.O. Box 1900. Freedom, CA 95019. (408) 761-2481. NCP (July '89)

FormSet \$555 is a collection of 65 business forms, including job estimates, earning statements, credit memo, time cards, and more, that can be customized with company name and logo. A fill-out program includes date stamping, field calculation, and so on. \$99. SoftView, 1721 Pacific Ave., Suite 100, Oxnard, CA 93033.

Interleaf Publisher \$55%

is a speedy multiuser layout system for producing large, complicated documents. Version 3.5 has an improved user interface, but it still suffers from poor lont management. Requires Mac II with 5 megabytes of RAM and hard disk. \$995. Interleaf, 10 Canal Park, Cambridge, MA 02141. (617) 577-9800. NCP

(Apr 39)

KeyCap Fonts \$\$\$\$
contains three typefaces designed specifically for writing computer documentation. Version 1.0. \$149.95. Paperback Software International, 2830 Ninth St., Berkeley, CA 94710. (415) 644-2116. NCP (June '89)

KeyMaster-The Art Importer \$555 creates PostScript tonts containing up to 16 graphic characters. Accepts logos, clip art, and other PICT and EPSF graphics. As fonts, graphics can be used in programs that don't normally accept them, and resizing is as easy as changing the point size. Version 1.0. Requires 1 megabyte. \$99.95. Altsys Corp., 720 Avenue F, Suite 109, Plano, TX 75074. (214) 424-4888. NCP

LetrTuck ttt

lets you add, delete, or modify the kern pairs for any installed font. Version 1.04. Requires 512KE or later. \$149. (Version 2.0 now available for \$99) EDCO Services, 12410 N. Dale Mabry Highway, Tampa, FL 33618. (800) 523-8973. NCP (June '89) MacTeX \$55%

is the TeX environment of choice for hard-core TeX users on the Macintosh. Very intimidating for others. Painfully slow and visually unattractive. Version 2.0. Requires 1 megabyte. \$750. FTL Systems, 234 Eglington Ave. E., Toronto, Ontario, Canada M4P 1K5. NCP (Apr '88)

PageMaker 1355 gives designers complete freedom over page layout. Uses pasteboard metaphor. All placement of text and graphics relies on hand-eye coordination. Color Extension add-on lets you edit a color image's CMYK values. Can't do four-color separations. Easy to learn. Version 3.02CE, Requires Mac Plus and a hardcasy to learn. Version 3.02c. neglines made rius and a ratio disk drive. \$595. Aldus, 411 First Ave. S., Seattle, WA 98104-2871. (Jan '90).*85, '87. *88 Eddy PageMakker Portfolio: Designs for Newsletters ttt provides 21 templates for newsletters with preset columns.

headlines, graphics, and captions. Documentation provides excellent tutorial in page design. Requires 512KE or later and PageMaker. \$99. Aldus, 411 First Ave. S., Seattle, WA 98104-2871. (206) 628-2375. NCP (May '87)

PhotoMac \$555 is a powerful color-retouching tool for photographs in PICT and TIFF. Displays and edits in 8-bit mode; saves in 8- or 24-bit modes. Makes color separations, but process requires substantial disk space. Version 1.0. Requires Mac II with 2 megabytes, color monitor, and 8-bit video card; hard disk with more than 2 available megabytes. \$695. Avalon Development Group, 1000 Massachusetts Ave., Cambridge, MA 02138, (800) 522-0265 or (508) 481-3700, ext. 649 in MA. NCP (July '89)

Publish It! \$555 is a moderately priced page-layout package designed for users with Pluses and SEs. Includes word-processing and simple drawing and painting tools. Works using a frame metaphor. Can rotate text. Limited color support. Version 1.1. Requires Mac 512KE, System 4.2 or later (System 6.0 or later preferred), and 800K drive; hard-disk drive recommended, \$395. Timeworks, 444 Lake Cook Road, Deerfield, IL 60015-4919. (Dec '89)

Publishing Packs \$35% bundle together three Adobe typefaces that work well for a particular publishing project. The packages offer substantial savings over purchasing the typefaces individually, and the documentation has useful information on typeface characteristics. Newsletters, \$395; Forms and Schedules, \$475; Presentations. \$475. Adobe Systems, Inc., 1585 Charleston Road, Box 7900, Mountain View, CA 94039-7900, (800) 447-3577, NCP

QuarkStyle 1111
is a collection of 72 designer-created templates for "instant" desklop publishing. The templates, which cover the gamul for desklop publishing a page's conceptrate on a page's business cards to newsletters, let you concentrate on a page's contents rather than its appearance. Version 1.0. Requires 1 megabyte and hard disk. \$295. Quark, 300 S. Jackson St., Suite 100. Denver, CO 80209. (800) 543-7711. NCP (Feb '89)

QuarkXPress \$184%
is a powerful page-layout program with 24-bit color, style sheets, and search-and-replace on text attributes. Also does four-color separations. Page layout is handled through text and graphics boxes that add precision to layout but are difficult to master. Version 2.12. Requires Mac Plus and hard-disk drive. \$795. Quark, 300 S. Jackson St., Suite 100, Denver, CO 80209. CP until registered. (Jan '90)

Ready, Set, Go! \$\$\$\$\%
combines an elegant interface with style sheets, fine-tuned typography, gray-scale editing, and spot color. The only program to provide thumbnail views of publications that allow for rearrangement of pages. It's also one of the first programs to store font information with documents, thus avoiding font ID conflicts. Version 4.5a. Requires Mac Plus and a hard-disk drive. \$495. Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07653.

SmartForm Designer 1111

is a full-featured forms-design and -management program. Includes SmartForm Assistant for forms fill-out and handling. Easy-to-use design environment. Imports color graphics. Requires Mac Plus and two 800K drives or a hard-disk drive. Version 1.1, \$399. Claris, 5201 Patrick Henry Drive, Santa Clara, CA 95052-8168. (Jan '90)

Springboard Publisher 111

combines page layout, word processing, and graphics capabilities in one easy-to-learn program. Too limited for serious desktop publishing but cost-effective for simple documents. Version Requires 1 megabyle. \$199.95. Springboard Software, 7808 Creekridge Circle, Minneapolis, MN 55435. (800) 445-4780. NCP (May '89)

Table Tools \$\$\$ is a dedicated table-creation package. Lets you create complex tables for importing into page-layout programs. Powerful features, but poor memory management, slow speed, and modal operation make it a hassle to use. Acceptable for in-house DTP creation of complex tables, but for simple jobs Word 4.0 is easier to use. Version 1.0. Requires Mac Plus and System 6.0.2; hard drive recommended. \$395. Mansfield Systems, 550 Hamilton Ave., Suite 150, Palo Alto, CA 94301. (415) 326-0603. NCP (Sept 89)

Textures \$55 is an implementation of TeX, the big daddy of typesetting programs. Good for people trained on mainframes in the early days. Otherwise very sticky with a high learning curve. Version 1.0. Requires Mac Plus. \$495. (Version 1.01F now available for \$495, \$395 education) Blue Sky Research, 534 S.W. Third Ave., Portland, OR 97204. (800) 622-6398. NCP (Apr '88)

TrueForm \$\$\$\$
creates an electronic form by scanning a preexisting paper one or importing from another design environment. No design capabilities. Automatic field definition. Form caching for faster printing. The only forms package with a database link. Version 2.0. Requires Mac Plus, two 800K disk drives or a hard-disk drive, and System 6.0 or later. \$395. Adobe Systems, 1585. Chatesto Read 8.0, Rev. 2009. Maustric View. CA 84030. Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900 (Jan '90)

UltraSpec 11%

performs copy-fitting chores such as calculating copy length, creating dummy pages, and producing printer specs. Version 1.0. Requires HyperCard and 1 megabyte, \$149.95. SoftStream, 19 White Chapel Drive, Mount Laurel, NJ 08054. (800) 262-6610. NCP (June '89)

GRAPHICS & DESIGN

Aldus FreeHand 2.0 \$\$\$\$\frac{1}{2}\$!
is a major upgrade. Greatly increased power includes up to 100 levels of undo, auto-trace, a blend command for interpolating shapes and colors, and expanded text manipulation. Has a steep learning curve but is relatively easy to use once you've got the hang of it. Version 2.0. Requires 1 megabyte. \$495. Aldus, 411 First Ave. S., Seattle, WA 98104-2871. (206) 628-2375. NCP (June '89)

MiniFinders

ArtClips ttt is a peculiar collection of EPSF "art work." Requires 1 megabyte. \$99. Tactic Software, 13615 South Dixie, Miami, FL 33176. (305) 378-4110_NCP (Aug '89)

Canvas 2.0 tittt

is a rich drawing/painting program, featuring tull Bezier curves, cutting and joining of polygons, skewing, perspective and distortion, auto-dimensioning, area and perimeter calculation, auto-tracing of bit maps, and full color support. Creates and edits high-resolution bit maps to 2,540 dpi. Slightly less powerful DA version available. Requires 1 megabyte, two 800K floppies, and System 6.0, 8299. Deneba Software, 3305 N.W. 74th Ava., Miami, FL 33122 (305) 594-6965. NCP (Apr 89)

Click & Clip \$55 offers seasonal graphics packages. Of the two quarterly editions released, the spring '88 package is the better collection. Requires a program that reads Encapsulated PostScript Format (EPSF) files. \$39.95 per edition. (Now available: C&C 500. \$395; C&C Military Arts, Version 1.1. \$149) Studio Advertising Art, 4305 E. Sahara, Suite 1, Las Vegas, NV 89104. (702) 641-7041. NCP

(Aug '88)
Clip3D 1111
is a line of 3-D, color-clip-art collections bundled with a powerful editing program. Images are in Pro3D formal and provide exceptional output quality. On a Mac II, DAs don't work while Clip3D is active. Version 1.0. Requires 1 megabyte. \$99 per package, including Clip3D editor. Enabling Technologies, 600 S. Dearborn, Suite 1304, Chicago, IL 60605. (312) 427-0408. NCP (Aug '89)

Cliptures 1111

is a series of business-oriented EPSF clip art. Volume 2, Business Images, is the best collection and can be cataloged with Curator. Requires 1 megabyte. \$129,95. Dream Maker Software, 4020 Paige St., Los Angeles, CA 90031. (800) 876-5665. NCP

Collector's Edition I 1111 contains a useful assortment of dingbals, borders, and two editable alphabets, all saved in Illustrator format. Requires 1 megabyte, \$125. (New edition now available for \$225) Adobe Systems, 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900, (800) 447-3577, NCP (Aug '89)

Cricket Color Paint \$\frac{1}{3}\frac{1}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1 Version 1.0. Requires Mac II or later, 2 megabytes, and System 6.0 or later, \$295. Computer Associates, 10505 Sorrento Valley Road, San Diego, CA 92121-1698. (Oct '89)

CA-Cricket Draw \$15% is an object-oriented drawing program that will produce stunning. high-quality output. Designed to print on PostScript-compatible devices such as the LaserWriter. \$295. Computer Associates, 10505 Sorrento Valley Road, San Diego, CA 92121-1698. (215) 889-1990. NCP (May '87)

CA-Cricket Presents 1111

is a presentation tool with strong emphasis on graphics. Good master template. Lacks import capability for text. Version 1.0. Requires System 4.2 or later. S695. Computer Associates, 10505 Sorrento Valley Road, San Diego, CA 92121-1698, (215) 889-1990. NCP (Dec '88)

CA-Cricket Paint ttt

is a monochrome paint program with a few interesting tools but not enough to make it first choice in its price range. FreshPaint gives it the best of both object-criented and bit-mapped applications. Supports resolutions up to 300 dpi. Version 1.0.

Requires Mac Plus or later and System 6.0 or later. \$195.

Computer Associates, 10505 Sorrento Valley Road, San Diego, CA 92121-1698. (Oct '89)

Crystal Paint \$55 creates an electronic kaleidoscope. It is MacPaint's Brush Mirrors gone wild in a small, simple, yet wonderful application. Does not work in color on Mac II. MultiFinder friendly. Requires 512K.

work in color on Mac II. Multi-inder friendly. Requires 512K. \$49.95. Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066, (408) 438-1990. NCP (Feb '88)

The Curator \$55.

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5506. NCP (Sept 98)

DeskPaint & DeskDraw \$1\$\$\$
is a set of DA graphics utilities. DeskPaint handles bit-mapped files, whereas DeskDraw handles PICTs. Somewhat busy interface due to be upgraded in early 1990. Very useful tools for desktop publishers. DeskPaint requires 512K; DeskDraw requires System 5.0 or later. \$129.95. DeskPaint, version 2.01C; DeskDraw, version 1.3. Zedcor, 4500 E. Speedway, #22, Tucson, AZ 85712. (Jan 90).

Digit-Art \$\$\$\$\$
is an overwhelming collection of EPSF clip art available on disk and CD-ROM. Comes with a well-designed catalog of images.
Requires a program that reads EPSF files. \$99. (Fifteen volumes now available for \$99 to \$149) Image Club Graphics, 1902 11th St. S.E., Calgary, Alberta, Canada T2G 3G2, (800) 661-9410. NCP (Aug '88)

use. Comes with separate libraries of object-oriented clip art, including arrows, landscaping, and chart symbols. Can import paint, PICT, and EPSF art. Version 1.0. Requires Mac Plus or later, two 800K drives, and System 4.1 or later, \$129. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101. (Nov '89)

DynaPerspective \$\frac{1}{3}\frac{1}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1}{3}\frac{1} from a floor plan. Objects can be made translucent, so windows and water effects are possible. It can also produce animations that "fly" you around buildings and in and out of rooms. Version 1.0. Requires Mac II or later. \$1,495. (Version 1.2 now available)

easily added or modified. Version 2.01 edits larger fonts and supports NFNTs. Requires 512K. \$99.95. (Version 2.0.2 now available) Altsys Corp., 720 Avenue F. Suite 109, Plano, TX 75074. (214) 424-4888. NCP (May '89)

Fontographer 3.0 1111 is an upgrade of the top PostScript-font editor/generator. New features include an integrated screen-font editor, auto-tracing, and a pen tool. Screen-font editor automatically generates bit mapped lonts but is strictly bare bones. A professional tool that now also includes PostScript "hints" within your fonts. Can also be used for creating logos but needs better drawing tools for this purpose. Version 3.0. Requires Mac Plus, System 4.2, and Finder 6.0. \$495. Altsys, 720 Avenue F, Suite 109, Plano, TX 75074. (Jan '90)

FontSizer \$\$\$\$\frac{1}{2}\$\frac{1}{2}\$\frac{1}{2}\$\text{creales high-quality screen fonts of any downloadable PostScript typeface in sizes up to 127 points. Excellent utility for producing large font sizes with true WYSIWYG. Version 1.7. Requires 1 megabyte, PostScript printer, and fonts. \$99.95. (Version now available with smaller screen font styles for \$129.95) Specialty Software Development, 110 Wild Basin Road, Suite Austin, TX 78746. (512) 327-8608. NCP (Apr '89)

Hermes & Tribune Fonts \$\$\frac{1}{2}\frac{1}{2}\frac{1}{2}\text{ are specially designed forts that come in large sizes (up to 120 points). Optimized for the ImageWriter LQ, LaserWriter ISC, and lax modems. These fonts can replace Helvetica and Times and look better than Apple's fonts. \$59.95. Miles & Miles, 704 N. Water, #1, Ellensburg, WA 98926. (509) 925-5280. (Sept '89) Adobe Illustrator 88 \$\$\$\frac{1}{2}\$\frac{1}{2}\$

is a professional-level graphics program from the people who defined the PostScript language. Uses templates for precise drawing and detailed artwork. Requires 1 megabyte. \$495. (Version 1.8.3 now available) Adobe Systems, 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900. (800) 447-3577, NCP (Oct '88) ★'88 Eddy

Image Studio \$\frac{\frac{1}{2}\f 6100. NCP (June '88)

Images With Impact! \$\$\$\$ is superb, imaginative EPSF clip art. Images are pregrouped for easy editing. Business 1 (\$129.95) has 175 editable images in 14 categories: Graphics & Symbols 1 (\$99.95) is equally impressive. Requires 1 megabyte. 3G Graphics, 11410 N.E. 124th St., Suite 6155, Kirkland, WA 98034. (800) 456-0234. NCP (Aug '89)

Lasertalk \$155
is a PostScript programming tool that establishes interactive contact with laser printers. Preview window and on-line help make it a powerful tool. Requires 1 megabyte and a PostScript printer. \$249.95. Emerald City Software, P.O. Box 2103, Menio Park, CA 94026. (415) 324-8080. CP until registered (May '88)

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signs, and other display type. Predefined envelopes let you create unique distortion effects. Works only with LetraFonts, which in turn are accessible only through the program. Version 1.0. Requires 1 megabyle and hard disk. \$495, plus \$75 per font. Fonts are copy-protected. Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07653. (201) 845-6100. (May '89) * 88 Eddy

Paramus, NJ 07653. (201) 845-6100. (May 89) ★ 88 Eddy

MacCalligraphy \$\$\$\frac{1}{2}\$\frac{1}{2}\$ simulates brush painting. User-designed Seals and Touches enable you to design your own signature tool and the style of brush you use. Takes some getting used to, \$175. (Version 2.01 now available for \$149.95) Qualitas Trading, 6907 Norlolk Road, Berkeley, CA 94705. (415) 848-8080. NCP (Feb '88)

MacDraw II \$\$\frac{1}{2}\$\fra

dithered and color patterns in its own documents but doesn't support color in the PICT II format. Version 1.0. Requires 1 megabyte and two 800K disk drives or hard disk. \$395. (Version 1.1v2 now available for \$399) Claris Corp., P. O. Box 58168, MS C-12, Santa Clara, CA 95052-8168. (408) 727-9054. NCP

MacGraphics \$\$\$ is an overwhelming collection of bit-mapped clip art — 13 thematic disks containing 10 megabytes of art. Unfortunately, most pictures are full-page, and reproduction quality suffers when they are reduced. Version 3.0. \$245. GoldMind Publishing,

12155 Magnolia Ave., Suite 3-B, Riverside, CA 92503. (714) 785-8685. NCP (Jan '89)

MacPaint ttt

hasn't lost its shine after all these years. Supports multiple windows, design templates, and a magic eraser for corrections. It lacks free rotation and distortion talents, Version 2.0, Requires 512K and second disk drive, \$125, Claris Corp., P.O. Box 58168. MS C-12, Santa Clara, CA 95052-8168. (408) 727-9054, NCP (July '88) * '85, '87 Eddy

MacroMind Director \$\$\$\$\$
is the best-equipped tool for creating color and black-and-white presentations. Object-oriented animation capabilities provide numerous editing features. Allows MIDI input. Version 1.0. Requires Mac Plus or later; 2 megabytes for color. \$695. MacroMind, 410 Townsend St., Suite 408, San Francisco, CA 94107. (415) 442-0200. NCP (Sept '89)

Mac3D \$\$\$% is a leature-laden 3-D program with a MacDraw-like interlace. PostScript-resolution shading with six variable light sources, rostoripriesonation sharing with six variable light solution, user-definable tools, and many more features. Clumsy interface to rotate objects and camera. Version 2.0. \$249. (Version 2.1 now available) Challenger Soltware, 18350 Kedzie Ave., Homewood, IL 60430. (312) 957-3475. NCP (Jan '87)

MapMaker \$\$\$\%\ is a digital cartographer that charts demographic and marketing information on a geographic basis. Wide variety of maps available — some at an additional cost. Version 3.0. Requires 512K. \$349. (Version 4.0 now available for \$395) Select Micro Systems, 322 Underhill Ave., Yorktown Heights, NY 10598. (914) 245-4670. NCP (Dec '88)

Metro ImageBase Electronic Art \$\$\frac{1}{2}\$\frac{1}{

like macro language, 3-D graphics, and a spreadsheet. Has a MacDraw-like feel, but added features compete with Claris CAD.

May have the best 3-0 capabilities among low-cost CAD

programs. Version 2.0. Requires Mac Plus or later, hard-disk
drive, and System 6.0; 2 megabytes recommended. \$695.

Graphsoft, 8370 Court Ave., Suite 202, Ellicott City, MD 21043. (Dec '89)

Modern Artist 2.0 \$\$% is still an interesting color paint program and has added a lew new features, but there's not enough here to justify the substantial price increase. Requires Macintosh II, \$395. Computer Friends. 14250 N.W. Science Park Drive, Portland, OR 97229. (503) 626-2291. NCP (Feb '89)

Persuasion \$\$\$\$\$
is an outstanding presentation tool with an excellent drawing environment. Extensive AutoTemplates™and color schemes as well as multiple master slides make it easy to turn out presentations quickly. Version 1.0. Requires Apple System 4.1 or later, 1-megabyte Mac Plus or later, and a hard disk. \$495. Aldus, 411 First Ave. S., Seattle, WA 98104-2871. (206) 628-2375. NCP (May '89) * '88 Eddy

Photon Paint 335 is not the equal of Studio/8 or PixelPaint, but it does offer a workable painting environment, multiwindow capability, some interesting special effects, and a lower price. Version 1.1. Requires Mac II with color card. \$299.95. (Version 2.0 now available for \$149.95) Microlllusions, 17408 Chatsworth St., Granada Hills, CA 91344. (800) 522-2041. NCP (May '89)

PictureBase \$\$\$\$\frac{1}{2}\$ is a powerful graphic librarian. You can store paint and PICT formatted items and attach keywords for later search and retrieval. \$69.95. (Version 1.2.3 now available for \$99) Symmetry, 225 E. First St., Suite 107B, Mesa, AZ 85203. (800) 624-2485. NCP (Sept '87) ★'86 Eddy

PixelPaint \$\$\frac{1}{2}\frac{1}{ file formats. Four-color separation is built in. Includes PixelScan utility for Sharp and Howtek color scanners that has excellent 8bit imaging. Version 2.0. Requires Mac II or SE/30 with 8-bit color board and 2 megabyles; hard-disk drive recommended. \$595. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94403. (Oct '89)

PixelPaint Professional \$555 is the 32-bit descendant of the original PixelPaint, Interface sometimes hides the well-designed painting tools' capabilities. Sometimes nices the well-designed painting tools capabilities. Supports four 256-color paleties per document. Includes several color-blending and -manipulating tools as well as anti-aliasing. Still has a few glitches but is a serious and necessary tool for electronic artists. Version 1.0. Requires Mac II series or SE/30; hard-disk drive; 2 megabytes for 8-bit color, 4 megabytes for frue color; 8-, 16-, 24-, or 32-bit video card; color or gray-scale monitor; and System 6.03 or later. \$699. SuperMac Technology, 485 Potero Ave., Sunnyvale, CA 94086. (Dec '89)

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PowerPoint 1111

is an easy-to-use desktop presentation tool. Good color schemes. Can send presentations to Genigraphics to produce color 35mm slides. Version 2.0. Requires System 4.1 or later, 1 megabyte, and two 800K drives or hard disk. \$395. Microsoft, 16011 N.E. 36th Way, P.O. Box 97017, Redmond, WA 98073-9717. (206) 454-2030. NCP (Aug '87)

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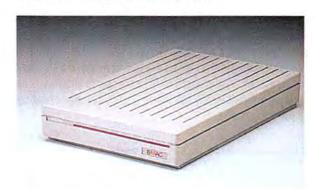
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MiniFinders

ShowCase F/X \$\$\$% is an animated-litting package that provides several textual effects, including Aegis' own Poly fonts, to use for making title sequences. Provides a good introduction to tweening and frame-by-frame animation. Version 1.0. Requires color Mac II and 2 by-riane animatonic Version 1.0. Regulars color was it and 2 megabytes. \$395. Aegis Development, 2115 W. Pico Blvd., Santa Monica, CA 90405. (Dec '89)

Smart Art \$155.
is a nifty PostScript utility disguised as a DA. It creates special

is a mity Postscript timity disguised as a DA. It creates special effects with both text and graphics, and it lets you import EPSF files into any program. The initial release has 15 text effects; future releases will include customizable graphics effects. Version 1.0.1. Requires 1 megabyte and PostScript printer. \$149.95. Emerald City Software, 800 Menlo Ave., Suite 102, Menlo Park, CA 94025. (Oct '89)

Smart Art II and III \$5555 are the second and third volumes of PostScript effects from Emerald City Software. Now packs an export facility and a much Emerald City Software. Now packs an export facility and a much improved DA that includes direct printing. Volume II includes graphic elements; Volume III has text effects. Version 2.0. Requires Mac Plus and PostScript printer. \$149.95 per volume. Emerald City Software, 800 Menlo Ave., Suite 102, Menlo Park, CA 94025. (Jan '90)

StandOut! 1115

is a presentation program built like a publishing program, with strong lext and graphics support. Automalic text flow around graphic objects. Lacks good graphic examples. Version 1.0. Requires 1 megabyte and two 800K drives or hard disk. \$295. Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07653. (800) 343-TYPE. NCP (Nov '88)

Streamline 115

Streamline \$\$\$\% is Adobe's dedicated PostScript auto-trace package. Auto-tracing is Adobe's dedicated Postscript auto-trace package. Auto-tracing is all it does. Can quickly produce nearly print-ready traces with little tweaking. Retains original images 'black-and-white values. Final touch-ups, however, must be completed in Illustrator 88 or a similar program. Expensive for a single-function utility. Version Requires Mac Plus or later and System 4.2 or later; 2 megabytes recommended. \$395. Adobe Systems, 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-

Studio/1 \$\$\$\$\%\$
is an excellent monochrome paint program that also has impressive flip-frame animation capabilities. You'll find an uncluttered animation surface, paint tools with 300-dpi capabilities, and a HyperCard playback utility (XCMD). Version 1.0 reviewed. Requires Mac Plus or later. \$149.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. (415) 572-2787. NCP (Sept '89)

Studio/8 \$5555 is a professional-level color paint application for the Mac II. Superior tool set, elegant interface, excellent performance and speed. Version 1.0. Requires Mac II and hard disk; 2 megabytes of RAM recommended. \$495. (Version 1.1 now available). Electronic Arts. 1820 Gateway Drive, San Mateo, CA 94404. (415) 572-2787. NCP (Jan '89) * '88 Eddy

(415) 572-2767, NCF (Jan 69) * 68 Eduty

Super 3D \$\frac{1}{3}\fra or technical work. Version 1.0. Requires 1 megabyte. \$295 (Version 2.0 now available for \$495) Silicon Beach Software, 9580 Black Mountain Road, P.O. Box 261430, San Diego, CA 92126. (619) 695-6956. NCP (Jan '88)

SuperPaint 2.0 \$155
SuperPaint 2.0 \$155
is the lirst upgrade of the original paint/draw program. Some of the new features are plug-in tools, auto-trace, Bezier curves, support for resolutions exceeding 300 dpi, and eight-color support. A good program but not particularly tast. Version 2.0.
Requires Mac Plus or later. \$199. Silicon Beach Software, P.O.
Box 261430, San Diego, CA 92126. (619) 695-6956. NCP (July '89)

Swivel 3D \$5555 quickly forms shaded solids in full color. Casts true shadows onto other objects and can project color graphics onto solids. Objects can be linked as jointed and sliding mechanisms that can be operated without accidental dismantling. It can tween-animate objects or fly your view through a scene, saving frames for playback. Superb object-manipulation interface. Version 1.0. Requires 1 megabyte, Mac Plus, and two 800K floppy drives, \$395. (Version 1.1 now available for \$495) Paracomp, 123 Townsend St., Suile 310, San Francisco, CA 94107. (415) 543-3848. NCP (Mar '89)

TrueForm \$555% takes a scanned image of a paper form and turns it into an electronic equivalent, complete with fields for entering data. It can automatically sum numeric fields. Requires external 800K drive, \$495; run-time version, \$295. (Version 2.0 now available for \$395 for Set-Up & Fill-Out; \$295 for Fill-Out Program 4-Pack) Adobe Systems, 1585 Charleston Road, Mountain View, CA 94039-7900. (800) 447-3577. NCP (May '88)

VersaCAD \$155 is a powerful CAD program that doesn't show any of its MS-DOS roots, Excellent element manipulation, full plotter support, Library user interface is crude. Requires 1 megabyte. \$1,995. (Version 2.11 nowavailable) Versacad, 2124 Main St., Huntington Beach, CA 92648. (714) 960-7720. NCP (July '88) ★'88 Eddy

VideoWorks II \$155% is an easy-to-use animation tool — the best available on the Mac. Has an Overview mode that acts as a slide show carousel

for presentations. Works in color on the Mac II. \$195. Requires 1 megabyte and an 800K drive. (Version 2.02 now available for \$295) MacroMind, 410 Townsend St., #408, San Francisco, CA 94107. (415) 442-0200. NCP (Mar 88) * 85, '87 Eddy VideoWorks II Accelerator \$33 compiles VideoWorks Il movies to make them run more smoothly.

Compensates for the QuickDraw screen display. Version 1.0. Requires 1 megabyte and VideoWorks II; hard-disk drive recommended. \$195. MacroMind, 410 Townsend St., #408, San

recommended. \$195. MacroMind. 410 Townsend St., #408, San Francisco, CA 94107. (415) 442-0200. NCP (Dec '88)

VideoWorks II Clip Animation \$\$\frac{1}{2}\f

charling capabilities, including 3-D. More difficult to learn and use than Persuasion and PowerPoint. Can't store a whole use that Personality and Personality and the Whole presentation. Requires Output Manager (include) to print to a stide maker, Includes only four LaserWriter fonts; set of additional LaserWriter Plus fonts costs \$195. Not a good choice unless you specifically need one of its features. Version 1.02. Requires Mac and System 6.0 or later; 2 megabytes required for Output Manager. \$395. Visual Business Systems, 700 Lake St., Suite H, Ramsey, NJ 07446. (Oct '89)

Vivid Impressions \$3% is carloonish EPSF clip art, some of it in color. Special Events

contains 130 images, many of them duplicates with minor alterations. Requires 1 megabyte, \$130. Casady & Greene, P.O. Box 223779, Carmel, CA 93922. (403) 624-8716. NCP (Aug '89)

WetPaint 1111; is a series of three-disk volumes of very-high-quality clip art. As series of three-disk volumes of very-high-quality clip art. As series of three-disk volume. Dubl-Click Software, 9316 Deering Ave., Chalsworth, CA 91311. (818) 700-9525. NCP (Sept '87)

Works of Art Laser Art \$333 is a nice collection of business-oriented EPSF clip art. Requires 1 megabyte. Version 1.0. \$99.95. Springboard Software, Inc., 7808 Creekridge Circle, Minneapolis, MN 55435. (800) 445-

4780, NCP (Aug '89)

World Class Laser Type 1111
is a six-volume collection of PostScript laser fonts that are an attractive alternative to the more expensive ones. Each volume comes on two 800K disks and includes screen fonts and PostScript-printer fonts. An excellent value, Requires PostScript printer, \$79.95 per volume, Dubl-Click Software, 9316 Deering Ave., Chalsworth, CA 91311. (Dec '89)

HARDWARE & ACCESSORIES

A+ Mouse \$\$\$\$
uses infrared light reflected off a special pad to track mouse
movement. No moving parts. Relative movement and clicking
action feel similar to the standard Mac mouse. Non-ADB version. \$99.95; ADB version, \$129.95. MSC Technologies, 47505

\$99.95; ADB version, \$129.95. MSC Technologies, 47505
Seabridge Drive, Fremont, CA 94538. (Oct '89)
AppleCD SC \$155
reads CD-ROM optical discs that contain up to 656 megabytes of data. Also plays audio compact discs. Reads High Sierra format, an industry standard for CD-ROM. Requires SCSI port.
\$1,295. (Now available for \$1,199) Apple Computer, 20525
Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (Dec '88)

Apple Scanner \$15% is not the state of the art but is adequate for scanner neophytes. The 4-bit (16 gray levels) scanner comes with AppleScan software and HyperScan, written by Bill Alkinson. Requires System 6.0, hard disk for full-page work, and SCSI connection cables, \$1,799. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. NCP (Feb 89)

BitPad Plus \$\$\$\frac{1}{2}\$\fr settings while in an application, \$495. SummaGraphics, 60 Silvermine Road, Seymour, CT 06483. (Oct '89)

CalComp 2300A \$\$\frac{1}{2}

the drawing area. Three sizes, six different input devices (pens and pucks), and several software lemplates available. AE Template
Manager lets you perform all the System and HyperCard menu
functions on the tablet. \$595 to \$2,495. CalComp, 14555 N.
82nd St., Scottsdale, AZ 85260. (Oct '89)
Classic Professional Graphics Display

is a low-cost color monitor for the Mac II. Good value but has an IBM-look about it. Green tint is annoying. Requires Apple video card. \$549. (Single monitor now available for \$300) Classic Components, 1490 W. Artesia Blvd., Gardena, CA 90248. (213)

217-8020. (June '88)

DataPak \$\$\$
is a 45-megabyte removable Winchester hard disk. Great for Is a 49-shelgabye fethovable winclesser field usis. Clear to backing up your main hard disk or transporting large amounts of data between office and home. Requires SCSI connector and System 4.1/5.5 or later. Drive, \$1,799.95. cartridges, \$149.95 each (now \$179.95 each) MASS Microsystems, 550 Del Rey Ave., Sunnyvale, CA 94086. (800) 552-7979. (Jan '89) Dest PC Scan 2000 1111

is an 8-bit scanner that saves images in up to 256 levels of gray. Can be configured for IBM PCs. Requires 1 megabyte. Scanner \$1,495; Publish Pac software, \$595; OCR text processor card, \$995. (PC Scan 2000 now available for \$1,395) New Dest, 1015 East Brokaw Road, San Jose, CA 95131. (408) 436-2700. NCP (Dec '88)

The Ergotron Workstation \$555 is the best, most versatile computer workstation around. This freestanding or wall-mountable heavy steel unit includes a high shelf for your Mac II and a movable, damped arm for your monitor. The unit comes in a variety of configurations. \$600 up. Ergotron, 3450 Yankee Drive, Suite 100, Eagan, MN 55121. (800) 888-8458. (Mar '89)

FAXstf \$55 is an early entrant in the lax modem race. Adequate, but slower than most fax machines, and using it as a normal modem requires changing plugs. Requires 1 megabyte of memory, and a hard disk is required. \$695. (Version 2.0 now available) STF Technologies, P.O. Box 247, Higginsville, MO 64037. (800) 876-0098. NCP (Feb '89)

Folix \$\$\$\$ is a 5.75-inch-square optical-tracking mouse replacement. Space saver but awkward for lefties. Button on top of the pointer handle for mouse clicks. Drawing setting for absolute movement. \$169. ALTRA Technology, 1200 Skyline Drive, Laramie, WY 82070.

FreeWheel Pointer \$33%, determines the user's head position by bouncing infrared light off a small, lightweight mirror on the user's forehead. Compact a smail, igniveright mirror on the user's forehead. Compact receiver unit and puff switch (can be mounted wherever convenient). Standard keyboard arrangement on-screen. Mac II and SE versions, \$1,095; ADB adapter, \$150. Pointer Systems, One Mill St., Burlington, VT 05401, (Oct '89)

Grappler LQ \$\$\$
hooks Macs up to parallel laser and 24-pin letter-quality printers. A cable, driver software, and special fonts combine to make changes of possible to make

dozens of once-unfriendly printers now compatible with the Mac. Requires 1 megabyte and a parallel printer. \$149. Orange Micro. 1400 N. Lakeview Ave., Anaheim, CA 92807. (800) 223-

HeadMaster \$33% is designed for users with little or no movement of their hands. It uses ultrasound signals emitted from a headset to determine the position of the user's head. Has a puff tube for the mouse button. On-screen keyboard appears as a couple of rows of characters. Very slow typing. Available for Mac 512K, Plus, SE, and II. \$995. Prentke Romich Co., 1022 Heyl Road, Wooster, OH 44691. (Oct '89)

Hewlett-Packard ColorPro Plotter ttt is an eight-pen desktop plotter that requires third-party software to drive it. Fonts are limited to an optional Graphics Enhancement to drive it. Fonds are limited to an opinional Graphics Enhancement Cartridge that requires some BASIC programming. \$1,295. Hewlett-Packard, 16399 W. Bernardo Drive, San Diego, CA 92127. (800) 654-5307. (Feb '88)

HyperDialer \$\frac{1}{2}\frac{1}{2}\frac{1}{2}\text{provides an interface between a phone and your Mac so you can disclosure training and the Paladou have accounts. Feb.

dial a number using one of the Rolodex-type programs, like SideKick, Focal Point, or QuickDEX. Hooks up between the Mac's sound port and a telephone handset. Requires 128K.

Mats South pull and a telephone handset, requires 1264.

Multi-Finder friendly, \$39.95. DataDeskInternational, 7651 Haskell Ave., Van Nuys, CA 91406. (818) 780-1674. (Sept '88)

ImageMaker \$\$\$\$
shoots 35mm color slides directly from the Mac. Supports most presentation software. Uses patterns to represent colors. Not fullycompatible with the Mar II. Requires 511K \$4.050 Marching. fully compatible with the Mac II. Requires 512K. \$4,995. MacDriver fully compatible with the Mac II. Requires 512K. \$4,995. Mac Driver software, \$149. (Image Maker Plus now available for \$1,995. Font cartridge, \$195. One-year warranty, \$320) Presentation Technologies, 743 N. Pastoria Ave., Sunnyvale, CA 94086. (408) 749-1959. (Feb '88)

Image Writer LQ \$\$\footnote{\footnote{1}}\text{tand graphics at 216 dpi. To do so, it requested. The product of the product

outputs letter-quarity text and graphics at 210 dpt. 10 db so, it reduces 72-dpi screen fonts to a third of their actual size. Takes a lot of memory. Printer Driver version 2.0. Requires 1 megabyte and large font sizes. \$1,400. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (Jan '89)

IS/ADB \$154

is a tablet that comes in three sizes with seven possible pointing the state of the size
devices, including multibutton pucks and multibutton styli. Operates in either absolute or relative modes; active area resizing

Operates in either absolute or relative modes; active area resizing on menu is handy for intensive drawing work. Twelve function keys, good for creating macros. \$495 to \$965. Kurta. 3007 East Chambers, Phoenix, AZ 85040. (602) 276-5533. (Oct '89) • IS/ONE Tablet \$\frac{1}{2}

Sapple's min-blacker foliaching hase primer. A staste main the LaserWriter Plus, with blacker blacks. Gray scale is less even than that of Plus. Requires 512K. \$4,599. (Now \$4,999) Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (May '88)

LaserWriter IINTX \$\$\$\$\frac{1}{2}\$! is Apple's top-of-the-line PostScript laser printer. 68020 chip makes it very speedy; expandable to 12 megabyles; SCSI hard

MiniFinders

disk can be attached for fonts. Requires 512K. \$6,599. (Now \$6,999) Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (May '88)

LaserWriter IISC \$\$\$
is Apple's low-end QuickDraw laser printer, Can be upgraded to

IINT or IINTX; reasonably fast. Requires 1 megabyte. \$2,799. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. (May '88)

Mac Crate 60-Mb Hard Disk tttt

puls a Seagate drive in a platinum casing. At \$14 per megabyte, it's a good consumer value. Also comes in 20-, 40-, and 80-megabyte models. Requires SCSI port. \$839. Crate Technology, 6850 Vineland Ave., North Hollywood, CA 91605. (800) 543-5808 national or (800) 323-9994 in CA. (Nov '88)

Mac-101 1313 is a keyboard alternative that has a good feel to it. Has a keypad, 15 function keys, and more. The 101-Keys DA lets you define macros. Also comes in an ADB version for the SE and II. Requires 512K. \$169.95. (Three models available for \$194.95 each) DataDesk International, 7651 Haskell Ave., Van Nuys, CA 91406. (818) 780-1674. Software NCP (Apr '88)

Mac 105 ADB Extended Keyboard 111 is a good alternative to Apple's Extended Keyboard, with a larger Return key, later and more sculpted key tops, and a lower overall weight. Requires Mac SE or Mac II. \$179; with Quickeys, \$199 (Now available for \$159; with Quickeys, \$189) Cutting Edge, P.O. Box 1259, Evanston, WY 82931-1259. (800) 443-5199. (Feb '89)

MacAdios II ttt

is a hardware and software interface for laboratory instruments. Standard configuration samples up to 142 kilohertz. Documentation is sketchy. \$1,290 for Macintosh Il-ready data-acquisition card (Now \$1,490); \$600 for MacADIOS II software interface. GW Instruments, 35 Medford St., Somerville, MA 02143. (617) 625-4096. (July '88)

MacBottom HD-70 Hard Disk tttt is an excellent drive that comes with some very good software, including HFS Backup. Requires SCSI port. \$1,995 (Now\$1695); 1,200-baud Hayes-compatible modem, \$200 extra. Personal Computer Peripherals Corp (PCPC), 4710 Eisenhower Blvd., Building A, Suite 4, Tampa, FL 33634. (800) 622-2888. NCP (407.90)

(Apr '89)

MacDot-LQ t/2 is a 24-pin dot-matrix printer that emulates the ImageWriter LQ. It uses the LQ driver for compatibility, but it's not networkable and costs nearly \$200 more. Bug-ridden emulation often loses touch with your Mac. Requires ImageWriter II or LO drivers' jumbo lonts for 216-dpi printing. \$1,590. (Now available for \$1,395. MacDot-PC available for \$1,555) Advanced Matrix Technology. 100 Rancho Road, Suite 27, Thousand Oaks, CA 91361. (800) 623, 7899.

637-7898. (Aug '89)

Mach IV Plus \$33%
has buttons on either side of the stick and one atop the joystick.
Can be used as a mouse emulator. Comes in ADB and non-ADB models. Also available is a peripheral called Mirage that adapts earlier non-ADB CH joysticks for ADB use. Mach IV, \$89.95; Mirage, \$54.95. CH Products, 1225 Stone Drive, San Marcos, CA 92069. (Oct '89)

CA 92099, (Oct 89)

MacIntizer ±\$\$\$
compares tavorably with other tablets in terms of mouse emulation and drawing but lacks some software features. No built-in capability for using or creating overlay templates. Provides developer stacks for HyperTalk and Pascal, Active area resized through Control Panel. HyperCard-stack documentation. \$495. GTCO, 7125 Riverwood Drive, Columbia, MD 21046. (Oct 89)

Mac 'N Touch 1111 is a touch screen recommended for applications requiring a lot of pointing and clicking; works less well for programs such as graphics packages that require fine control. Available as an add-in screen for Mac SE and II models and as a snap-on screen for the SE only. Mac N Touch Add-In, \$745 (SE), \$895 (Mac II); Mac 'N Touch Snap-On, \$595 (SE only). MicroTouch Systems, Ten State St., Woburn, MA 01801. (Oct '89)

MacRecorder \$355% is an audio digitizer for adding sounds to your Mac, animations, or HyperCard stacks. Supports an extensive array of audio-manipulation effects. HyperSound Toolkit makes adding sounds to HyperCard stacks easy. Version 2.0. Requires Mac Plus and 512K (1 megabyte highly recommended); HyperSound requires HyperCard version 1.2.1. \$249. Farallon Computing, 2201 Dwight Way, Berkeley, CA 94704. (Jan '90)

Dwight Way, Berkeley, CA 94704. (Jan '90)

MacTable 1112;
is an elegant Danish worktable that holds a Mac and printer with room to spare. The 30-inch deep by 60-inch wide table is made of particleboard and must be assembled. Cabinet is optional. Table, \$289; cabinet, \$139, ScanCo, P.O. Box 3217, Redmond, WA 98073-3217. (206) 481-5434. (Mar '88)

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icroSpeed, 44000 Old Warm Springs Blvd., Fremont, CA 94538. (Oct '89)

McIntyre \$3\$% is a joystick for people who can't use their hands. Can be mounted on a gooseneck stand. You manipulate the stick in your mouth to move the cursor while your tongue presses down on a button on top of the stick for clicking. An image of the keyboard appears on the bottom of the screen. Users can select letters and carry out most keyboard functions. Extremely sensitive. \$350. McIntyre Computer Systems, 22809 Shagbark, Birmingham, MI 48010. (Oct '89)

Micro III-620 \$\$\$\$% is a last 600-megabyte internal hard disk for the Mac II. The drive is a repackaged Impremis Wren V (Control Data). Average access time is 16 milliseconds. Requires Mac II with low-profile SIMMs. \$4,995. MicroNet Technology, 20 Mason, Irvine, CA 92718. (714) 837-6033. (Aug '89) MouseStick \$\$\$\$\%

MouseStick \$11% is useful where precise definition of movement is needed. The joystick has programmable settings; buttons can be programmed to carry out mouse-type functions or execute keyboard commands with single-, double-, or triple-clicking, \$129.95. Advanced Gravis Computer Technology, 1602 Carolina St., Suite #D-12, Bellingham, WA 98226. (Oct '89)

Mouse Touch \$35

Industrial of the section of the sect 888 S. Greenville Ave.. Suite 121, Richardson, TX 75081.

NetModem \$553 is a 1,200-baud modem that can be accessed by all users on an AppleTalk network. The modem's display lights and the dial tone are simulated on-screen. Requires 512K. \$599. Shiva, 155

are simulated on-screen, requires 512A, 5059, 511W, 150 Second St., Cambridge, MA 02141, (617) 864-8100. (Feb '88) Personal LaserPrinter 3555 is a non-PostScript laser printer at a great price. Clumsy workarounds required in some applications. Printing can be slow. Requires 1 megabyle. \$1,999. (Now \$2,099) Fonts Plus. \$299. GCC Technologies, 580 Winter St., Waltham, MA 02154. (617) 890-0880. (Apr '83)

PhoneNET \$\$\$\$\$ is an AppleTalk-compatible network. Network can be up to 3,000 feet in length. In-place, unused phone cabling can be used for network and can be combined with AppleTalk on the same network, \$59.95 per node, Farallon Computing, 2201 Dwight Way, Berkeley, CA 94704, (415) 849-2331, (Dec 86) * 87 Eddy

ProPoint \$\$\$
has a click button and a small lock button on the lower left side of the trackball casing. Left-handed people may have to take their fingers off the ball to press the buttons. \$86. Abalon Technology, 48431 Milmont Drive, Fremont, CA 94538, (Oct '89)

PW10SL \$1\$3.

is a drawing tablet that offers friendly software setup and easy

is a drawing tablet that offers friendly software setup and easy macro programming. Basic system menu commands, a mousing area, software controls, a macro pad, and a small keyboard appear along one side. Click-and-drag scaling and moving of the drawing area. \$799. Personal Writer, 1900 Avenue of the Stars, Suite 2817, Los Angeles, CA 90067. (Oct '89)

QMS Colorscript 100 \$355
is the first color PostScript printer that uses a four-color thermal way transfer technology. Works a Applicable revealed.

wax transfer technology. Works on AppleTalk. Excellent typographic capability. Currently supports only a handful of applications. Requires 1 megabyte. \$21,995. (Model 30 now available for \$19,995) QMS, 1 Magnum Pass, Mobile, AL 36689. (205) 633-4500. (Oct '88)

QMS-PS810 111/2;
is an eight-page-per-minute, 300-dpi PostScript laser printer

that competes with the LaserWriter IINT. Two megabytes of RAM that competes with the LaserWriter INT. I Wo megabytes of HAM is standard; upgradable to 3 megabytes. Emulates HP LaserJet, 7475 (HPGL), and Diablo 630. \$5,495. (New price: Now \$4,995) Laser Connection, 7851 Schillinger Park W., Mobile, AL 36608. (800) 523-2696. (July '88) quadLYNX \$\$\$\frac{1}{2}\$\$\frac

both ADB and non-ADB versions. \$99.95. Asher Engineering, 15115 Ramona Blvd., Baldwin Park, CA 91706. (Oct '89)

Radius Accelerator 25 \$\$\$\$ can make your Mac SE run 50 percent faster than a Mac II. The add-in accelerator card has a Motorola 68020 CPU that runs at 25 megahertz, and an optional 25-megahertz 68881 math coprocessor. \$1,695; \$2,195 with optional 25-megahertz 68881. (Now\$1,395;\$1,895 with optional 25-megahertz 68882) Radius, 1710 Fortune Drive, San Jose, CA 95131. (408) 434-1011. (Oct '88)

SpeedCard \$\$\$\$%
is an accelerator board for the Macintosh SE that more than is an accelerator board for the Macintosh SE that more than doubles the speed of most applications. The board uses the 68000 chip found in the SE and an optional floating-point 68881 chip for number crunching. Requires Macintosh SE. \$399; \$699 with coprocessor. SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. (Nov 88) StarTime/VideoShow \$\frac{1}{2}\$ is an expensive hardware-software combination for creating and showing color presentations. Let's you create color presentations with an SE. Then using the VideoShow box and a monitor (including NTSC), you can play back your gresentations without the color presentation w

with an St. Then using the VideoShow box and a monitor (including NTSC), you can play back your presentation without a Mac. Software is clunky and doesn't really take advantage of Mac graphics. Version 1.0. Requires Mac Plus or later, 20-megabyte hard-disk drive, VideoShow Model, color monitor, presentation software, and System 6.0 or later. \$199; VideoShow Model 240, \$1,795; Model 260, \$3,995; Model 280, \$9,495. General Parametrics, 1250 Ninth St., Berkeley, CA 94710.

Tektronix 4693D Color Printer ###

Tektronix 4693D Color Printer \$55
is a 300-dpi bit-mapped color printer. Colors look smooth and
rich. Uses bit-mapped screen fonts; most type has noticeable
jaggies. Requires Mac II with color monitor. Recommended 8megabyte configuration, \$11,490. (Now \$8,995) Tektronix, P.O.
Box 500, Beaverton, OR 97077. (800) 835-6100. (Oct '88)

Turbo Mouse ADB \$555
is a trackball that is a lavorite mouse replacement. Mousing and
locking functions can be reversed for left-handed people. Has a
"chordion." Feature for a user-specified Command-leve function.

"chording" feature for a user-specified Command-key function. Space-efficient, \$169.95. Kensington Microware, Park Ave. S., New York, NY 10011. (Oct '89)

New York, NY 10011. (Oct 89)

V-series Smartmodem 9600 \$\$\$\$\foats\

is the smallest, lightest Mac printer around. It san ink-jet unit that can produce resolutions of up to 192 opi. It can run offere chargeable batteries or AC and weighs just 3 pounds. It comes with a good selection of Bitstream fonts. Printing quality varies widely depending on the paper and ink used. Printer Driver version 1.0. Requires 1 megabyte and hard disk. \$699. GCC Technologies, 580 Winter St., Waltham, MA 02154. (617) 890-0880. (Apr 89)

NUMBER CRUNCHING

Analog Connection Workbench \$\$\$\$\foatsilon\$, is an icon-based application generator for general-purpose data acquisition, control, and analysis. Users create a flow diagram that makes live color plots. Powerful and very easy to use. Version 3.0. Requires Mac SE or II. \$995. Strawberry Tree, 160 S. Wolle Road, Sunnyvale, CA 94086. (408) 736-8800. NCP

Data Desk Professional \$55% lets you see stalistics with more ease than any comparable Macintosh program. Plots variables so you can analyze data to macinitosin program. Prois Variables so you can analyze data to see what patterns develop. Version 2.0. Requires 1 megabyte and two 800K disk drives or hard disk. \$495. Odesta, 4084 Commercial Ave., Northbrook, IL 60062. (800) 323-5423. NCP (Nov '88)

Microsoft Excel \$\$\$\$\$
version 2.2 is a major upgrade. Improvements include variable substitute and the second seco

row heights, multiple tonts, improved macros, hot links to other Microsoft products, and an end to the 1-megabyte limit. Excel remains the standard. Version 2.2. Requires Mac Plus or later, System 6.0.2 or later, and two 800K drives; hard disk recommended. \$395. Microsoft, 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717. (206) 454-2030. NCP (Sept 89)

Exstatix \$55% is a powerful, full-featured statistics program. Accepts userwritten plug-in modules. Very good graphing ability and excellent manual. Version 1.0.21. Requires Mac Plus or later. \$349. Select MicroSystems, 322 Underhill Ave., Yorktown Heights, NY 10598. (Nov '89)

Fastat \$\$\$\frac{1}{2}\$ is a subset of Systat. It also features a Mac interface and as a result is somewhat slow. Features included should be enough for all but the most demanding. Version 1.0. Requires 1 megabyle. \$195. Systat, 1800 Sherman Ave., Evanston, IL 60201, (Nov 89) LabTech Notebook \$3% is a general-purpose data-acquisition and -analysis package. This port from the DOS world has menus, but the interface is so

Ihis port from the DOS world has menus, but the interface is so poorly designed that you might as well be using a PC: This version doesn't even have a Print function, Version 1.0. Requires Mac II and System 5.0 or later. \$995. Laboratory Technologies Corp., 400 Research Drive, Wilmington, MA 01887. (508) 657-5400. NCP (July '89)

LabVIEW 2 \$3553
is a graphical programming environment for creating applications for GPIB and other data-acquisition and -control operations.

Data analysis includes complex math and signal processing. Users can create on-screen control panels to emulate test instruments. The most complete such package on either PC or Mac. Requires 1 megabyte and hard disk. \$1,995. National Instruments, 12109 Technology Blvd., Austin, TX 78727-6204 (800) 531-4742. NCP (July '89)

MacInstruments \$35%:
is an oscilloscope emulator with chart-recorder functions and some statistics. Records up to 833,000 samples per second and works with a wide selection of GW hardware. Version 1.04. Requires 1 megabyte. S790. GW Instruments, 35 Mediord St., Somerville, MA 02143. (617) 625-4096. NCP (July '89)

MacLab \$\$\$\$ turns your Mac into an oscilloscope with chart-recorder functions. turns your Macinto an oscilloscope with chart-recorder functions. This hardward/software package records 12 samples/hour to 80,000 sample/second. Nice interface and analysis features, such as slope of tangent and area under curve. Built-in ampliliers. Version 2.5. Requires 512K. \$2,925; optional differential ampliliers. \$1,125. World Precision Instruments, 375 Quinnipiac Ave., New Haven, CT 06513. (203) 469-8281. NCP (July '89)

MacPacq \$1\$ is a hardware/software oscilloscope and chart-recorder emulator that records 2 samples/hour to 10,000 samples/second. The portable hardware can be used remotely. Version 1.05e. Requires 512K.\$1,195; optional external amplifiers, \$295. BioPac Systems,

5960 Mandarin Drive, Suite D5, Goleta, CA 93117, (805) 967-6615. NCP (July '89)

Mathematica \$55%/ is a powerful tool for doing all kinds of math. Offers arbitrary-precision numeric calculations, symbolic computation, PostScript graphics, and programmability. Version 1.03. Requires 1 megabyte and a hard-disk drive. Requires 2 megabytes to run kernel. \$495; \$795 for the Mac II version. (Version 1.2 now waithth Walten Beach R.O. 98, 6680 (Appendix). II kernel, 3495, 3795 for the Mac II version. (Version 1.2 now available) Wolfram Research, P.O. Box 6059, Champaign, IL 61826, (800) 441-6284. NCP (Nov '88) *88 Eddy

Math View Professional \$33
is an equation solver that combines 2-D and 3-D plotting with

routines for matrices, differential equations and integrals, complex numbers, and the like. Interface leaves a lot to be desired. Version 1.0. Requires 512KE and two disk drives. Mac II and MultiFinder friendly. \$249.95. BrainPower, 30497 Canwood St., Suite 201. Agoura Hills, CA 91301, (818) 707-1712, NCP (Sept '88)

Microsoft Works \$\$\$\%\$\ has been the integrated program of choice for years, and version 2.0 shouldn't change that. Package includes word processing, spreadsheet, database, telecommunications, and object-oriented graphics. Supports color. Excellent value. May be all the software you'll ever need. Version 2.0. Requires Mac Plus or later and two 800K drives, \$295. Microsoft, 16011 N.E. 36th Way, Box 97017. Redmond, WA 98073-9717. (206) 454-2030. NCP (May '89)

101 Macros for Excel \$\$\$\$
ofters all the power of macros without having to learn how to write
them. Some gems include a macro to transpose rows and columns, and a search-and-replace macro. Requires Excel \$69.95. Individual Software 125 Shoreway Rd., Sulle 3000, San Carlos, CA 94070. (800) 331-3313 or CA (415) 595-8855. NCP

Parameter Manager Plus 1111

analyzes data, using spreadsheetlike interface in real time. It can handle both hand-entered and imported data. Includes statistical nandie both nand-entered and imported data, includes statistical quality control, equation fitting, predictive maintenance, histograms, drawing, and presentation. Version 3.0. Requires 1 megabyte. \$595; \$795 with communications module. GenRad, 510 Cottonwood, Milpitas, CA 95035. (408) 432-1000. NCP

Stat View II 11111

is a remarkably complete data-analysis package. Essential for any kind of descriptive, comparative, or multivariate statistics, Works in color on the Mac II. Version 1.01. Requires Mac II or SE equipped with 68020 and 68881 math coprocessor and two 800K disk drives or hard disk. \$495. (Version 1.03 now available for Mac II, Mac SE/30) Abacus Concepts, 1984 Bonita Ave., Berkeley, CA 94704. (415) 540-1949. NCP (Oct '88)

WingZ tttt

combines a powerful and roomy spreadsheet with an easy-to-use scripting language for developing customized applications. Lacks a few standard spreadsheet niceties such as borders and plane splitting but makes up for it with glitzy graphics, including color and 3-D. Version 1.0. Requires T megabyte. \$399; University edition, \$89. Informix Software, 16011 College Blvd., Lenexa, KS 66219. (913) 599-7100. NCP (June '89)

PERSONAL FINANCE

MacInTax \$5555 is an excellent tool for preparing tax forms. Intuitive, easy-touse. Accepts data from leading personal-finance programs. Good built-in help. Liberal upgrade policy for current owners. California forms set also available. \$119 lederal; \$65 California. (Version 2.1 now available) SoftView, 4820 Adohr Lane, Suite F Camarillo, CA 93010. (805) 388-2626. NCP (Mar '87) ★'86 Eddy

MacMoney \$\$\$\$ is a financial manager that uses information gleaned from your checks and deposit slips. Produces a variety of reports and graphs. Version 3.01 reviewed. Requires 512KE and printer. \$119.95. (Version 3.5 now available) Survivor Software, 11222 La Cienepa Blvd., Suite 450, Inglewood, CA 90304. (213) 338-0155. NCP (July '88) *86 Eddy Andrew Tobias' Managing Your Money

is a feature-laden personal-accounting system with added financial and time-management functions. Uses double-entry accounting. Too-cute documentation. Version 2.0. \$219.95. Requires 1 megabyte, 128K or later ROMs. (Version 3.0 now available) MECA Ventures, 327 Riverside Ave., Westport, CT 06881, (203) 226-2024, NCP. (Apr '89)

Quicken 11111 is the best tool for home budgets, better cash-flow management, and tax record keeping. Mimics your checkbook, so keeping track of your finances is easy and intuitive. Provides detailed

track of your finances is easy and intuitive. Provides detailed reports supporting tax deductions and sources of income for schedules A, B, C, D, and E, Forms 1040 and 2106; and Canadian tax forms. Version 1.5. Requires Mac 512K, System 3.2, and Finder 5.3. \$59.95. Intuit, 540 University Ave., Suite 50, Pato Alto, CA 94301. (Dec '89) *88 Eddy

Wall Street Investor \$\$\frac{434}{35}\$
spots stock market trends. Downloads information from an electronic service. Good charting ability. Previously known as Market Pro. Version 3.0. Requires 1 megabyte, two 800K drives or hard disk, Hayes-compatible modem, and an I.P. Sharp account. \$695. Prof Plus Software, 2150 E. Brown Road, Mesa, AZ 85213. (602) 461-3296. NCP (Oct '88) AZ 85213. (602) 461-3296. NCP (Oct '88)

HTH ITIES

Anti-Virus Kit 111%

is an antivirus utility that comes in three parts; an alert INIT, an application that installs a history file on any disk that records changes to that disk, and an application that helps identify the time an infection occurred. Doesn't include repair capabilities. Version 1.0. Requires 512KE and System 4.1. \$79.95. 1stAid Software, 42 Radnor Road, Boston, MA 02135. (Oct '89)

AutoMac III \$15% is similar to Tempo II and Apple's MacroMaker but is generally easier to use and comes with excellent documentation and a powerful Macro Editor. Version 2.0, Requires 512KE, \$79.95. powerfold Macro Callot. Version 2.0. Regulars 51242, 57.95.
Also distributed with Microsoft products (Word 3.02 and 4.0, File 2.0). Genesis Micro Software, P.O. Box 6236, Bellevue, WA 98008. (206) 747-8512. NCP (Feb '89)

AutoSave DA 111

is insurance against system crashes. It saves your work automatically at intervals from 1 to 99 minutes. Compatible with automatically at intervals from 1 to 99 minutes. Compatible with many applications but not recommended for use with databases. \$49.95. (Update: AutoSave 2, Version 1.01 now available for \$49.95) Magic Software, 1602 Cascio Drive, Bellevue, NE 68005. (800) 342-6243. NCP (Jan '88)

BulkMailer+ \$13.*
iis a basic mail manager with many powerful sorting features. Report setup can be a bit difficult but otherwise a line program. Can handle up to 9,500 names and addresses. Don't use with

MultiFinder (in spite of what the manual says), Version 3.23. Requires 1 megabyte. \$350. Satori Software, 2815 Second Ave... Suite 560. Seattle, WA 98121. (Oct '89)

224-1995. NCP (Sept '89)

Capture 15151
is the most reliable screen-capture utility. Can capture tutl screens or any area to either the Clipboard or a PICT file. Supports 8- and 32-bit color. May have to be renamed to avoid

Supports 8- and 32-bit color. May have to be renamed to avoid NIT conflicts. Version 2.0. Requires System 5.0 or later. \$59.95. Mainstay, 53118 Derry Ave., Agoura Hills, CA 91301. (Jan '90) ClickPaste \$\frac{3}{2}\frac{1

CA 91301. (818) 991-6540. NCP (Sept 89)

Complete Undelete \$\$\frac{4}{2}\frac{4}\frac{4}{2}\frac{4}{2}\frac{4}{2}\frac{4}{2}\frac{4}{2}\frac{4}

Road, Boston, Ma UZ133. (Jan 90)

Copy II Mac \$\$\$\$
is a collection of powerful yet easy-to-use disk utilities. Disk copying and much more. Version 7.2. Requires 512K. \$39.95. Central Point Software, 15220 N.W. Greenbrier Parkway. #200, Beaverton, OR 97006. (503) 690-5162. NCP (Mar 89)

DiskExpress \$3\$\$\$
oplimizes hard-drive performance by reorganizing tragmented files. Best of its kind. Version 1.5. Requires 512K. \$69.95.
ALSoft, P.O. Box 927, Spring, TX 77383-0927. (713) 353-4090.

DiskFinder 33% searches disks for files as well as cataloging disks. Requires 512KE. \$49.95. (Version 1.07 nowavailable) Williams & Macias, South 3707 Godfrey Blvd., Spokane, WA 99204. (800) 752-4400. NCP (Feb '89)

DiskTools Plus \$\$\$\$\$ is a set of eight useful DAs and applications. Earlier version was sold as Battery Pak. The DA Disk Tools II is a Finder replacement. Also included are an RPN calculator, Phone Pad, and Calendar Manager. Requires 512K, \$49.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. (415) 572-2787. NCP (Mar '88)

Eureka: The Solver \$33 is a free-form numerical equation solver. Standard trigonometric and logarithmic functions are available, as is treatment of imaginary and complex numbers. \$195. Borland International, 1800 Green Hills Road, Scotts Valley, CA 95066. (408) 438-8400. NCP (Mar '88)

Fastback II 1111 is Fifth Generation's major upgrade of its backup program. Supports incremental and differential backups and your choice of compression levels. Backup configurations can be saved as preference files. Macro language supports automated procedures. Nonstandard dialog boxes are occasionally unclear. Version 2.0.
Requires Mac 512KE and System 4.2 or later. \$189. Filth
Generation Systems, 11200 Industriplex Blvd., Baton Rouge, LA 70809. (Oct '89)

Fast Formatter \$\$\$\$\\frac{1}{2}\$\$ is the best, surest, most reliable bulk disk formatter available. And the price is right. Works with any Mac. Version 3.0. Free. Beyond, P.O. Box 31990, Tucson, AZ 85751. (Oct '89)

FEdit Plus \$555 is the file and disk editor for everyone, from newest Mac owner to oldest. It can do more for your disks and files than any other application. Can recover deleted MFS files. If you own a Mac, get it. HFS compatible. \$49.95. MacMaster Systems, 108 E. Fremont. Ave., #37, Sunnyvale, CA 94087. NCP (Sept '86) ★'86 Eddy

FileMagic t

is a file-management utility that tries to increase the power of the Standard File Dialog box. Your most frequently used files or Standard The Divided to the Standard The Sta

West, Mukilleo, WA 98275. (206) 828-1789. NCP (July 89)

Findswell \$\$\frac{1}{2}\frac{1}

Cruz, CA 95061, (405) 423-5056, NCP (NOV 67) × 67 Eduy
1stAid Kit 1111
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1stAid Kit 1111
1stAid Kit 1111
1stAid Kit 1111
1stAid Solfware, 42 Radnor
Road, Boston, MA 02135, (617) 783-7118. NCP (June '88)

Font/DA Juggler Plus tttt

gives you unlimited access to almost any number of fonts, desk accessories, and sounds. Uses hierarchical menus. \$59.95. (Version 1.14 now available) ALSoft, P.O. Box 927, Spring, TX 77383-0927. (713) 353-4090. NCP (May '88)

Forecaster ###

lets you draw a curve on a chart. If then converts the curve to neatly rounded values for use in spreadsheets or elsewhere. hearly foolings and early useful for all who do budgets and other financial projections. Version 1.0. Requires 1 megabyte, \$69.95. Palo Alto, Software, 260 Sheridan Ave., #219, Palo Alto, CA 94306. (Oct '89)

offers a nice mix of security utilities. I two forms of encryption are supported, and files or volumes can be "sanitized" to U.S. national standards for top-secret materials. Version 1.04. Requires 512K. \$195. Transfinite Systems Co., P.O. Box N, MIT Branch Post Office, Cambridge, MA 02139-0903. (Nov '89)

Freedom of Press \$\frac{1}{2}\fra

page correctly. In terms of Adobe fonts, you're restricted to the 35 fonts of the LaserWriter Plus. Creates PostScript copies of your documents that are always larger than the original. Version 2.1. documents and are always larger than the original. Version 2.1. Requires Mac II, SE/30, or any Mac with math coprocessor; 1.5 megabytes; 800K drive; 2.5 megabytes of hard-disk space; and application that generales PostScript output. \$495. Custom Applications, Building 8, 900 Technology Park Drive, Billerica. MA 01821. (Jan '90)

HFS Backup tttt/

HFS Backup \$\frac{1}{2}\frac{1}\frac{1}{2}\f

Works 2.0 and PageMaker 3.01 are also available). Includes works 2.0 and PageMaker 3.01 are also available). Includes utility macro software and a keyboard overlay. Works well and contains many useful macros (some for the Finder as well). Version 1.0. Requires System 6.0.2 or later, MacroMaker (included), extended keyboard. \$44.95 per version. K.I.S.S. (keep It Simple Software), 324 Fuller, Suite C-3, Helena, MT 59601-9910. (Jan '90).

Icon-ltt 1515/

lets you create icons to use as an alternative to menu commands. Use its 47 icon templates or create your own. Version 1.0. \$79.95. (Version 1.2 now available) Tactic Software, 13615 South Dixie, Miami, FL 33176. (305) 378-4110. NCP (Feb '88)

INIT cdev ttt
is a no-frills freeware (NIT manager that lets you turn INITs on or
off simply by clicking on the names on a scrollable list. INIT cdev
is accessible at startup, but it cannot make temporary changes. Version 1.0 reviewed. Requires 512K or later. Free; available on GEnie and CompuServe. John Rotenstein, P.O. Box 165, Double Bay, New South Wales 2028, Australia. NCP (Aug '89)

Bay, New South Wales 2028, Australia. NCP (Aug '89)

INITPICKET \$\$\$\frac{4}{2}\frac{4}{2}\frac{4}{2}\frac{1}{2

Inix \$\$\\frac{1}{2}\$ is a combination INIT and DA that lets you choose separate startup sets. It does not let you decide to turn off a set temporarily (until the next startup), and it lacks the "run all" or "skip all" commands found in Aask and INITPicker. Version 1.1 reviewed. Requires 512K or later. \$49.95, Natural Intelligence, 86 Richdale Ave., Cambridge, MA 02140. (617) 266-7858. NCP (Aug '89)

JetLink Express 113
is a printer driver that lets you print to HP non-PostScript
printers. Provides a set of four special outline fonts that it
automatically uses when you choose the standard Adobe fonts
(additional fonts are available for \$198). Includes cable. Terrible

MiniFinders

manual, Check application compatibility before buying. Version 1.0.1a. Requires Mac Plus; hard-disk drive; 512K printer memory (1 megabyte recommended), LaserJet IID, LaserJet III series, LaserJet Plus, DeskJet Plus, DeskJet, or HP-compatible printer; and System 6.0.\$149. GDT Softworks, 4664 Lougheed Highway, Suite 188, Burnaby, British Columbia V5C 6B7, Canada.

(Jan '90)

LANDesign \$135%
is versatile land-surveying software. It has a range of options that allow it to work the way surveyors worked before they had a Mac to help them. This is an intelligent program and thus easy to use. Version 1.11. Requires 512KE or later and System 4.2 or later; hard disk recommended. \$595. Compuneering, 113 McCabe Crescent, Thornhill, Ontario L4J 2S6, Canada. (416) 738-4601.

NCP (Sept '89)

MacBarCoda \$\$\$\frac{1}{2}\$\frac{1}{2}\$
is a bar-code generator. Outputs as EPSF files, Easily the best program of its kind. Requires 1 megabyte and hard-disk drive. \$990. ComputaLabel, 18A Regent St., Narborough, Leicester

\$990. ComputaLabel, 18A Regent St., Narborough, Leicester LE9 5DJ, England, (Oct '89)

MacPrint \$\frac{4}{3}\frac{1}{3}\text{ is a printer driver that lets you print to non-PostScript Hewlett-Packard printers. Provides screen fonts for every imaginable HP font cartridge and special Compugraphic screen fonts. Includes cable, Good manual. Check application compatibility before buying. Version 1.1. Requires Mac Plus; hard-disk drive; 512K printer memory (1 megabyte recommended): LaserJet IID, LaserJet III, LaserJet III, LaserJet Plus, DeskJet Plus, DeskJet, or HP-compatible printer; and System 6.0. \$149. Insight Development, 2200 Powell St., Suite 500, Emeryville, CA 94608. (Jan '90)

Mac TREE \$\frac{4}{3}\frac{4}{3}\text{ displays your files in the form of a hierarchical tree. Good idea, poor performance. Carl view tree easily, Good search function.

poor performance. Can't view tree easily, Good search function. Requires 512K. \$69.95. (MacTREE Plus, Version 2.0, now available) Go Technology, 850 Tanager, Suite 4, Incline Village, NV 89450. (702) 831-3100. NCP (Apr '88)

available to Becomology, so I langer, Stille 4, Incline Village, NV 89450. (702) 831-3100. NCP (Apr '88)

MasterJuggler \$\$\frac{1}{3}\frac{1}{3

This data can be vital if you run into conflicts or problems. Free. Mi Concepts, P.O. Box 8822, Kentwood, MI 49508. (Sept '89)

Multi Clip \$55% lets you create as many Clipboards as memory will allow. Can be used as a replacement for the Clipboard and Scrapbook. Has limited editing capabilities but lots of customizing possibilities. Version 1.0. Requires Mac Plus or later and System 6.0.2 or later. (Version 1.01 now available for \$99) Olduvai Software, 7520 Red Road, Suite A, South Miami, FL 33143. (800) 822-0772. NCP (Sept '89)

MultiDisk 3555 is an excellent software disk partitioner that allows partitions to

Marsh Ltd., 1200 Post Oak Blvd., Suite 210, Houston, TX 77056. (800) 325-3587. NCP (Sept '88)

On Cue \$355/2 lets you switch applications without returning to the Finder. Under MultiFinder, active applications are listed on a pop-up menu. Can also launch directly to a specific document. Version 1.0. Requires 512K. Mac II and MultiFinder friendly. \$59.95. (Version 1.3 now available) ICOM Simulations, 648 S. Wheeling Road, Wheeling, IL 60090. (312) 520-4440. NCP (Sept '88)

OmniPage \$555 is a very good OCR program that can create editable text files out of scanned images. It works only with certain scanners and requires a lot of memory, so be sure you can meet its requirements before you buy. Version 1.0. Requires 68020 and 4 megabytes. \$695. (Version 2.0 now available for \$795) Caere, 100 Cooper Court, Los Gatos, CA 95030. (800) 535-7226. NCP (Mar '89) PC Tools Deluxe for the Macintosh \$13% is a collection of seven applications, two DAs, and two INITs that

perform various functions, from disk and file recovery to backup to disk optimization to encryption. Would be better if its elements

were better integrated. Doesn't have the smoothness Mac users expect. Requires 512KE or later and System 4.2 or later. \$79. (Version 1.1 now available) Central Point Software, 15220 N.W. Greenbrier Parkway, #200, Beaverton, OR 97006. (503) 690-8090. NCP (Aug '89)

8090. NCP (Aug 89)

PictureBook \$1\$\$\$
is a superb Scrapbook replacement, It catalogs your Scrapbook and lets you resize and/or crop anything that can be copied to the Clipboard. There's a lot of power here, and the interface is excellent. Version 3.1. Requires 512K or later, hard drive recommended. \$69.95. Loop Software, P.O. Box 1249. Mento Park, CA 94026. (800) 288-7631. NCP (Sept 89)

POWERmenus \$\$\$\$\$
is two products in one. The first allows full access to menus from anywhere on the screen. The second, called Gadgets, includes a phone dialer; notepad; and useful application, DA, and Control Panel item Jaunchers. Version 1.03. Requires System 5.0 or later. \$79.95. Magic Software, 1602 Cascio Drive, Bellevue, NE 68005. (Jan '90)

PowerStation \$\$\$\$\$ is an extremely easy-to-use, versatile, and powerful Finder substitute. Loaded with powerful leatures. Comes with Pyro! \$59.95. (Version 2.5 now available) Fifth Generation, 1322 Bell

\$59.95, (Version 2.5 now available) Filling Gerbration, 1522 bell Ave., Tustin, CA 92680, (800) 873-4384, NCP (Dec '87) Pyrol \$3\$\frac{1}{2}\text{!}/2

is the premier Mac screen saver. All the required settings are found in the Control Panel. Pyrol darkens the screen and then shoots off fireworks, which can be mesmerizing. It can also display a clock. Version 3.3. Requires 512K or later and System 4.1 or later. \$24.95. Fifth Generation Systems, 1322 Bell Ave., Tustin, CA 92680. (800) 873-4384. NCP (Sept '89)

QuicKeys \$\$\$\$
lets you make full use of your keyboard. Assign any command (menu choices, DAs, etc.) or series of text blocks and/or command to any key or key combination. Enormously powerful; necessary for Apple Extended Keyboard owners. Requires 512K. \$99.95. (Version 1.2 now available) CE Software, P.O. Box 65580, West Des Moines, IA 50265. (515) 224-1995. NCP (Jan '88) ★'87 Eddy

Read-It! \$\$\$\\^2\)
is an upgrade of Olduvai's OCR package. Still a good value and performer. Now includes printer drivers for most scanners, batch processing, background operation under MultiFinder, and 22 font tables. Recognizes multiple columns, italics, some foreign characters but not underlined text. Version 2.0. Requires 1 megabyte. \$495. (Version 2.1 now available) OLDUVAI, 7520 Red Road, Suite A, South Miami, FL 33143. (800) 822-0772. NCP (June '89)

Redux \$\$\$\$½ is an excellent incremental-backup program. Lets you back up is an excellent incremental-backup program. Lets you back up filles, folders, or entire volumes. F control, you can write your own "scripts," using the Redux control language, BackTalk. Comes with Redux Restore, a restore utility that can be distributed freely. Version 1.5. Requires 1 megabyte. \$99. Microseeds Publishing, 7030-B. W. Hillsborough Ave., Tampa, FL 33634. (813) 882-8635. NCP (July '89)

RésumExpert \$555 is a set of résumé templates with a superb manual. If you need a good résumé, this is the way to go about it. Versions for Word 1.05 (shudder) and Works are also available at the same price. Requires 512KE and Word 3.0 or later, \$49. A Lasting Impression,

49 Thornberry Road, Winchester, MA 01890. (Oct '89)
SAM (Symantec AntiVirus

Macintosh) \$353 is the best commercial antivirus utility available. Includes an alert INIT, repair capabilities, and customizable alert options and alert INI , repair capabilities, and customizable alert options and has a useful Report feature. Version 1.0. Requires Mac 512KE and System 4.2/Finder 6.0 or later. \$99.95; annual-upgrade subscriptions, \$60; one-shot upgrades, \$15. Symantec, 10201 Torre Ave., Cupertino, CA 95014. (Oct '89)

Screen Gems \$15. Symantec, 10201 Screen Gems 10. State of the color utilities for Mac II owners. Color Desk puts art behind your desktop, Dimmer dims the screen when the Mac is inactive, and Switch-a-Roo lels users switch between any law color modes instally. Globe is a peat demo. and TN-3 lets.

two color modes instantly. Globe is a neat demo, and TN-3 lets you customize the Finder's Color menu. Version 1.0. Requires YOU CUSTOMIZE the Fillies's Good mental, version 1.3. negatives Mac II with 2 megabytes, color monitor, and System 4.2 or later. \$79. Microseeds, 7030-B W. Hillsborough Ave., Tampa, FL 33634. (813) 882-8635. NCP (Sept '89)

ScreenRecorder \$\$1\$\frac{1}{2}\frac{1}{2}\frac{1}{2}\text{ is a utility for recording your on-screen Mac activities, Ideal for presentations and training. Uses a tape-recorder model. "Tapes" can include sounds recorded with applications such as MacRecorder and can be a fixed length or loop. Recordings can also be installed into HyperCard stacks for easier distribution. Version 1.0. Requires 1 megabyte. \$195. Farallon Computing, 2201 Dwight Way, Berkeley, CA 94704. (415) 849-2331. NCP

Sentinel \$\$\$\$ encrypts data files (or sets of files) using a super-secure DES or a super-fast SuperCrypt algorithm. Provides high-level security il you can keep your passwords secret. Requires 512KE, \$295. (Version 2.0 now available for \$149) SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086. (408) 245-2202. NCP

Set Clock \$\$\$\$% makes a ten-second phone call to Leitch Video's master clock driver (near the East Coast) and then sets your Mac's time within one-second accuracy. Version 1.8.1. Requires 300-bps or faster modem. Free. Leitch Video International, 10 Dyas Road, Don Mills, Ontario M3B 1V5, Canada. (Nov '89)

Silverlining \$333/2 is an advanced hard-disk-utility set. It has the best disk-partitioning software available and can format most hard disks. It also has powerful and sale optimizing and testing leatures. Excellent performance. Also includes DS Backup, OK backup software, and a nice disk duplicator. Version 5.16. Requires Mac Plus and SCSI device. \$69.95. La Cie, 16285 S.W. 85th, Suite

306, Tigard, OR 97224. (Jan '90)

SmartScrap and The Clipper \$\$\frac{4}{3}\frac{1}{2}\fr provides you with a transparent Clipboard window, allowing you to resize or crop a graphic to the area that it will be pasted to. \$59.95. (Version 2.01 now available for \$89.95) Solutions International, 30 Commerce St., Williston, VT 05495. (802) 658-

5506. NCP (July '87) *87 Eddy
SnapJot \$353
is a utility that lets you capture screens or parts of screens. Differs from similar products in that the captured window remains onscreen in a real window and so can be used as you work. Version 2.0. Requires System 4.1 or later, \$36. Trillium Software, 21W171 Coronet Road, Lombard, IL 60148. (Oct '89)

Sonar Professional ½ is an overpriced text searcher that still requires too much ongoing effort for the results it is capable of. If the setup requirements were eliminated, the search abilities and speed would be without peer. Version 3.1. Requires Mac Plus. \$795. Virginia Systems Software Services, 5509 W. Bay Court, Midlothian, VA 23112. (Jan '90)

Sound Manager Package \$\$\$\$\footnote{1}\$ is a group of well-implemented sound-file manipulators and players. The best and most versatile utility set available for sound (as opposed to music) aficionados. As a bonus, many useful and amusing sounds are included on-disk. Version 1.40. Requires 512K and System 4.1 or later. \$20 shareware fee. Ettore Software, 67 Rue de la Limite, 1970 W-Oppem, Belgium. Include International Reply Coupon with all information requests.

SoundMaster \$\$\$\%\ is an elegant cdev that lets you assign sounds to a wide range of actions, including startup, shut down, disk insertion, and assorted key presses. Version 1.2. Requires System 4.1 or later. \$10 shareware fee. Bruce Tomlin, 15801 Chase Hill Blvd., \$109, San Antonio TX 78256. (Nov '89)

Stepping Out II \$\$\$\$\$ is a software alternative to a large-screen monitor. Lets you is a soliwate attendance to a large-stocen monitor. Les you create a virtual screen (as large as memory allows) inside the Mac's 9-inch screen. Automatically scrolls to new document position as you type or draw. Version 2.0. Requires 1 megabyte. \$95. Berkeley System Design, 1700 Shattuck Ave., Berkeley, CA 94709. (415) 540-5535. NCP (Oct '88)

Stuffit \$3555 compresses files to reduce the amount of space they take up oncompresses files to reduce the amount of space they take up ondisk. Great for transferring documents via modem. Also joins
and encrypts files. Version 1.5. Requires 512KE. Shareware lee,
\$25. Aladdin Systems, 217 E. 86th St., Suite 153, New York, New
York 10028. (212) 410-3080; also available on most electronic
services. NCP (Dec '88)

Suitcase II \$\$\$\$\$
is even better than its predecessor. Increased file-management
capabilities early layout one p09 foot DA sound or Even files.

capabilities enable you to open 99 font, DA, sound, or FKey files at a time. Can display any installed font in any style. Fonts can also appear in their proper typelaces on their font menus. Includes Font Harmony for resolving font number conflicts, and Font & Sound Valet for font and sound compression. Version 1.2.2. Requires 512KE or later. \$79. Fifth Generation Systems, 1322 Bell Ave., Tustin, CA 92680. (800) 873-4384. NCP (June 89) * 87 Eddy

SUM II \$\$\$\$\$
is an upgraded and expanded version of the essential SUM data-recovery utility. Now includes utilities for partitioning, encrypting, backing up (based on Redux), and optimizing. None of these modules is preferable to the dedicated packages available, but they all work. The recovery module is still the best and now has a much improved interface. It's the reason to buy SUM II. Version Requires Mac Plus or later, System 4.2, and Finder 6.0.
 S149.95. Symantec, 10201 Torre Ave., Cupertino, CA 95014. (Dec '89)

SuperClock! \$555 is simply the best on-screen time indicator or clock. Can work properly in every environment and also has excellent timer and alarm functions. Version 3.5. Requires System 4.1 or later. Free. Steve Christensen, CompuServe 76174,1712; AppleLink Christense1. (Nov '89)

SuperGlue II 33333 is the newest and best print-to-disk program. Offers superior is the newest and best print-to-disk program. Offers superior operation along with many nice added touches, such as Glue Notes (Post-it-like notes) and One-Timer, an Fkey that makes operation immensely easier. Version 1.0. Requires System 6.0 or later. \$119.95. Solutions International, 30 Commerce St., Williston, VT 05495. (Nov 89)

Tablecloth \$\$\$\$ is a small package that makes using MultiFinder less confusing and far more pleasant. Hides all but the active window when you triple-click in the window. Version 1.0. Requires System 6.0.1 or later and MultiFinder 6.0.1. Introductory price, \$29.95; regular

price, \$49.95. User-Tek, 4444 E. 66th St., Suite C, Tulsa, OK 74136. (Oct '89)

Tempo II tttt/

is a powerful keyboard macro program that gives owners of extended keyboards their money's worth. Especially good for building sequential macros. Features include conditional bullong sequential macros. Features include conditional branching and the ability to remember menu selections by name. Version 1.0. \$149.95. (Version 1.02 now available) Affinity Microsystems, Ltd., 1050 Walnut St., Suite 425, Boulder, CO 80302. (303) 442-4840. NCP (Dec '88)

80302. (303) 442-4840. NCP (Dec '88)

TextPert \$\frac{1}{2}\frac{1

change case; count the number of lines, words, sentences, or paragraphs in a selection; and search and replace on character strings (including invisibles). Supports macros and external commands written in Pascal. Includes a spelling checker. Version 1.0. Requires 512KE or later. \$99.95. Preferred Publishers, 5100 Poplar Ave., Suite 617, Memphis, TN 38137. (901) 683-3383. NCP (July '89)

Virex \$555% is an excellent virus preventer, detector, and eradicator. Works against known viruses and has an excellent support and update history. Version 2.1. Requires Mac Plus and System 5.0 or later. \$99.95; annual update service, \$75. HJC Software, P.O. Box 51816, Durham, NC 27717. (Jan '90)

Virtual \$35% provides virtual-memory capability for any Mac equipped with a 68030 or 68020 with PMMU. Works smoothly and comes in versions with a PMMU for those with 68020-based Mac Ils. Version 1.05. Requires 2 megabytes (highly recommended) and 8 megabytes of contiguous hard-disk space; System 6.0.2 recommended. Without PMMU, \$199, with PMMU, \$275. Capacity Corp. 125 Constitution Drive, Mento Park, CA) 94025. Connectix Corp., 125 Constitution Drive, Menlo Park, CA 94025

Word Wrapper \$\$\$\% is the sort of simple utility you find useful several times a day (if you telecommunicate much). Wraps or breaks Mac-created text files to a user-specified length and also adds line breaks (using some intelligence) to received text files that need them. Requires 512K. \$29.95. International Technology Development Corp., 1990 Lombard St., #250, San Francisco, CA 94123-2807.

WorksPlus Command \$555 letsyoubuild and deline macros for all Works modules. Predefined macros provide for an even tighter integration of the program's macros provide for an even lighter meghation of the program's word-processing, spreadsheet, and database modules. Requires 1 megabyte. \$99.95. (Version 2.0 now available for \$149.95) Lundeen & Associates, P.O. Box 30038, Oakland, CA 94604. (800) 233-6851. NCP (May '88)

XTreeMac \$t is a file-management utility that uses a file-card metaphor. Can recover deleted files, and supports filters for grouping specified types of files. Not for network use. Buggy. Version 2.0. Requires Mac 512KE or later, System 4.2, and Finder 5.3 or later. \$99. XTree Company, 430 Santa Fe Road, San Luis Obispo, CA 93401. (805) 541-0604. NCP (Sept '89)

WORD PROCESSORS

ArchiText \$\$\$\$
is a text processor with many hypertext capabilities as well as the ability to include graphics. "Nodes" of text are accessed by means of different "maps." Very powerful. Version 1.0. Requires 1 megabyte. \$349.95. (Version 2.04 now available for \$395) BrainPower, 30497 Canwood St., Suite 201, Agoura Hills, CA 1321, (491), 772, 173, NCP (56), 304 91301. (818) 707-1712. NCP (Feb '89)

DocuComp \$\$\$
lets you compare two versions of a word-processing document. Displays inserted text in the newer document with underlining and moved text in boldface. Older document shows deleted and moved text with strikeout characters. Excellent reporting feature details all the revisions made to a document. Supports plain-text, WordPerfect, WriteNow, and Word formats. Version 1.11.
Requires Mac 512KE or later, System 4.1; Finder 5.5; and WordPerfect, WriteNow, or Word; hard-disk drive recommended. \$159.95. Advanced Software, 1095 E. Duane Ave., Suite 212,

Sunnyvale, CA 94086. (Dec '89)

Expressionist 1111
is a powerful DA that allows you to create complex mathematical equations from within an application. Equation manipulation has never been easier. (Version 2.0 now available for \$129.95) Prescience, 814 Castro St., San Francisco, CA 94114. (415) 282-5864. NCP (July '87)

ExpressWrite 1113 // is a letter-writing DA. Has excellent mail-merge capability and merges envelopes as well as letters. Good formatting ability. Restricted only by inability to use graphics. Version 1.01. Requires 512KE or later and System 4.1 or later. \$99.95. Exodus Software, 8620 Winton Road, Suite 304, Cincinnati, OH 45231.

(513) 522-0011, NCP (Sept '89)

FeiMa-P \$\$\$\frac{4}{2}\$\frac{4}{2}\$\$ allows users to create their own Chinese characters. This Chinese

word processor follows the Mac interface more closely than Kaihin Brushwriter. Lets you create your own characters for those that aren't included in the dictionary. Version Previewed. Requires 512K or later. \$585. (Version 4.1 now available for \$595) Wu Corp., P.O. Box 699, Avon, CT 06001. (203) 677-1528. CP (May 89) Formulator \$\$\$\$%

is a powerful and easy-to-use formula-setting application. Can output in TeX as well as "regular" format. Version 1.1. Requires 512K and runs only with U.S. System software. \$149.95. ICOM Simulations, 648 S. Wheeling Road, Wheeling, IL 60090.

(Oct '89)

FullWrite Professional \$\$\foatstyle{\frantyle{\frant{

Graham Speller \$\frac{\frac{1}{4}}{1}\$ is a DA-based spelling checker, includes macro leature. Good guesser in interactive mode. Clumsy interface. Version 1.1. \$44.95. Graham Software, 8609 Ingalls Circle, Arvada, CO 80003, (303) 422-0757. NCP (Sept 88)

Kadmos Greek Font \$35%; is a full character set of ancient Greek that prints on any PostScript printer. Requires learning new typing skills, but excellent quality makes it worth the effort. \$85. (Version 2.0 now available.) Allotype Typographics, 1600 Packard Road, Suite 5, Ann Arbor, MI 48104. (313) 663-1989. NCP (Oct *87)

Kaihin Brushwriter \$5 is a Chinese word processor that fails to support the Mac interface. It has 8,000 characters. You must speak Chinese to use this program. Won't work with System 6.0. Version 2.0. Requires 1-megabyte SE and adapter (included) to save and print files. \$599 for professional package (reviewed). Pacific Rim Connections, 3030 Atwater Drive, Burlingame, CA 94010. (415)

Connections, 303 Aware of Dive, Burningaine, CA 94010. (415) 697-0911. NCP (May 89)

Language Master \$\frac{4}{5}\frac{1} 40,000 unique entry points with synonym information for different parts of speech. Version 1.0. Requires Mac Plus, System 4.2, and Finder 4.0. \$99. Franklin Software, 3511 N.E. 22nd Ave., Fort Lauderdale, FL 33308. (Jan '90)

Lookup tttt

is an on-call, quick, single-word spelling checker. Designed for the way writers really work. Uses the 93,000-word Spellswell dictionary. \$49.95. (Version 2.0 now available for \$59.95.) Working Software, P.O. Box 1844, Santa Cruz, CA 95061-1844. (408) 423-5696. NCP (Dec '87)

MacEnvelope tttt/

is the best envelope printer currently on the market. Can handle color, graphics in the return-address fields, messages, and labels. Data can be imported. Sorts on name or zip code. Version 4.1. Requires 512KE, \$89,95. Synex, 692 Terth St., Brooklyn. NY 11215. (Oct '89)

MacPhonebook \$\$\$\\^{\pma}\$ handles name-and-address lists (up to 1,600 entries). Its forte is printing out the lists in large, medium, and small (Little Black Book) formats. Version 1.0. Requires 512K. \$39.95. Synex, 692 Tenth St., Brooklyn, NY 11215. (Oct '89)

is MacWrite's lirst major upgrade and a big increase in power. Excellent interface. Powerful Search/Replace function. Elegant multiple-column and mail-merge features. Terrible performance on 68000 machines. Version 1,0. Recuires Mac Plus or later and two 800K drives or hard disk. \$249. Claris Corp., 5201 Patrick Henry Drive, P.O. Box 58168, MS C-12, Santa Clara, CA 95052-8168. (408) 727-9054, NCP (Aug '89)

MergeWrite \$55%

is a mail-merge program for MacWrite (also works with ASCII files). Program combines names and addresses from a data file into predefined fields in a form letter. Also allows simple conditional IF/THEN/ELSE equations. \$49.95. Software Discoveries, 137 Krawski Drive, South Windsor, CT 06074. (203)872-1024. MCP (Dec '87)

MindWrite \$555

integrates outlining and word processing better than any other program. Fixes many problems of the earlier version. Sophisticated search and select options. Unimpressive speed. Version 1.1. \$195. (Version 2.1 now available) DeltaPoint, 200 Heritage Harbor, Suite G, Monterey, CA 93940 (408) 375-4700. NCP (Feb '88)

Mishu tttt

is a DA that turns MacWile and Microsoft Word into a Chinese word processor. It will also work with Cricket Draw, HyperCard, or any program that reads PICT files. You must use MacWrite 3.5 or later and Word 3.0 or later. Version 2.1. Requires 512K or later \$89. Xanatech, 20 Fresh Pond Place, Cambridge, MA 02138. (617) 492-7463. NCP (May '89)

Nisus \$113 is powerful but not perfect. This direct descendent of the QUED/ M text editor has an Easy-GREP function, a built-in MacDraw-like graphics environment, and indexing capabilities. Lacks hyphenation, kerning, lootnotes, and cross-reference-marking functions. Version 1.0. Requires Mac Plus, two 800K drives or hard-disk drive, and System 4.2. \$395. Paragon Concepts, 990

Highland Drive, Suite 312, Solana Beach, CA 92075. (July '89)
QUED/M \$\$\$\$\frac{\$\frac{4}{3}\frac{4}{3}\frac{4}{3}}{2}\$
is an excellent lext editor; that saves documents in a form readable by most computers and printers. Doesn't support graphics or multiple fonts, Programming language allows creation of database. Version 2.01. \$129. (Version 2.07 now available for \$119) Paragon Concepts, 990 Highband Drive, Suite 312, Solano Beach, CA 92075. (619) 481-1477. NCP (Mar '88)

QuickLetter \$\$\$\$\%\ is a well-designed and thoughtfully implemented DA for the creation of letters and envelopes. You can create stationery, complete with graphics, and maintain an address book including salutations. It's the best envelope creator/printer in any word processor. Version 1.0. Requires 512K. \$124.95. Working Software, P.O. Box 1844, Santa Cruz, CA 95061-1844. (408) 423-5696. NCP (Apr '89)

Sensible Grammar \$\$\$
corrects some of the more glaring errors that writers make. Also

analyzes the word count and structure of sentences to come up with a readability rating. Slow. Version 1.1d. Requires 512K. \$99.95. (Version 1.5.2 now available) Sensible Software, 335 E. Big Beaver, Suite 207, Troy, MI 48083. (313) 528-1950. NCP

Spelling Coach Professional 1111

is a DA and stand-alone spelling checker as well as a thesaurus. Includes dictionary definitions. Off-the-wall phonetic guesses. Version 3.0. \$195. Deneba Sottware, 3305 N.W. 74th Ave., Miami, FL 33122. (305) 594-6965. NCP (Sept '88) Spellswell \$\frac{1414}{527}\frac{1}{327}\fr

is a stand-alone batch spelling checker. Also checks for punctuation and other errors. Good dictionary, thorough checking, simple interface but weak guessing. Version 2.0. \$74.95. Working Software, P.O. Box 1844, Santa Cruz, CA 95061-1844. (408) 423-5696. NCP (Sept '88) * 86 Eddy Thunder II \$\$\frac{4}{24}\frac{1}{25}\frac{1

dictionaries and applications with which it should run. Checks dictionaries and applications with which it should run. Checks for spelling, punctuation, capitalization, and double-word errors. Includes application-specific "compatibility modules" to retain character formatting. Editable glossary. Version 1.0. Requires Mac Plus and System 5.0 or later. \$79.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. (Oct '89)

Microsoft Word 4.0 \$\frac{1}{3}\frac{1}

and a ruge its of useful readures. Tables command lets you create multicolumn tables of text and graphics easily. Has hot links to Excel and Microsoft Mail. Has enough DTP capabilities to format almost any document, without compromising its performance as a dedicated word processor. Requires 512KE or later, two 800K floppy drives or hard disk, System 3.2, and Finder 5.3 or later. \$395. Microsoft, 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717. (206) 454-2030. NCP (July '89)

Word Finder \$55%

word Finder \$35% is an electronic thesaurus that won't replace your trusty Roget's but is still useful for checking synonyms on the fly. Large, respectively. Version 2.0. Requires 512K. Mac II and MultiFinder friendly. \$59.95. Microlytics. Two Tobey Village Office Park, Pittsford, NY 14534. (716) 248-9620. NCP (Sept '88)

WordMaker \$35%

(irst appeared as an Amiga word processor, ProWrite. Low-to-midled receivements in interface a finite to that of the original.

midlevel program with an interface similar to that of the original MacWrite. Supports up to eight open documents, imported color graphics, and mail-merge. Slow performance on 68000-based machines. Not a good choice compared with MacWrite II or WriteNow. Version 1.0. Requires Mac 512KE or later and System 4.1 or later; two 800K drives or hard-disk drive recommended. \$124.95. New Horizons Software, P.O. Box 43167, Austin, TX

78745. (Nov '89)

WordPerfect \$3\$%
is a good choice for offices needing compatibility but not so hot otherwise. Good internal file-management system and macroonerwise. Good internal internal agement system and macro-maker. Uses hidden formalting codes, hierarchical menu system. Requires Mac 512KE and System 4.1 or later. Two 800K disk drives or a hard disk recommended. Not fully compatible with System 6.0. \$395. WordPerfect, 1555 N. Technology Way, Orem, UT 84057 (801) 225-5000. NCP (Feb '89) Works Plus Spell \$33% is a speedy spelling and hypenation checker for Microsoft Works I includes a pleasary for abbreviations and time/date

Works. It includes a glossary for abbreviations and time/date stamping. The biggest drawback is its limitation to one program. \$99.95. (Version 2.0 now available.) Lundeen & Associates, P.O. Box 30038, Oakland, CA 94604. (800) 233-6851. NCP (Oct. 2011) 1975. 1975. '87) H'87 Eddy

Microsoft Write \$\$\$
is a "beginner's" version of Word 3.0. More features than some

word processors in its class, but not all of the features work well. Poor value and an expensive upgrade path to Word. \$175. Requires 512K. (Version 1.0 now available for \$125) Microsoft, 16011 N.E. 36th Way, P.O. Box 97017, Redmond, WA 98073-9717, (206) 454-2030, NCP (May '88) **WriteNow 2.0 \$\$\$** is the fastest, best pure-writing program available. Excellent

spelling checker, mail-merge, graphics inclusion, tootholes, and header/looter control. Still runs on any Mac. Wonderful interface, as intuitive as the original MacWrite interface. Supports RTF. Version 2.0. Requires 128K or later. \$195. T/Maker Company, 1390 Villa St., Mountain View, CA 94041. (415) 962-0195. NCP (May '89)

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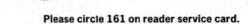
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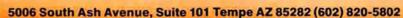
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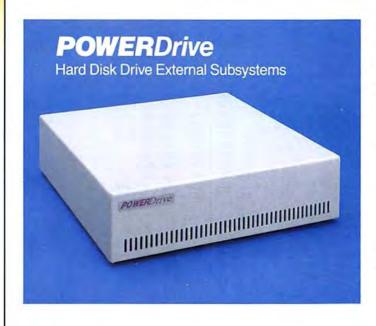
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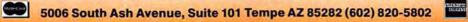
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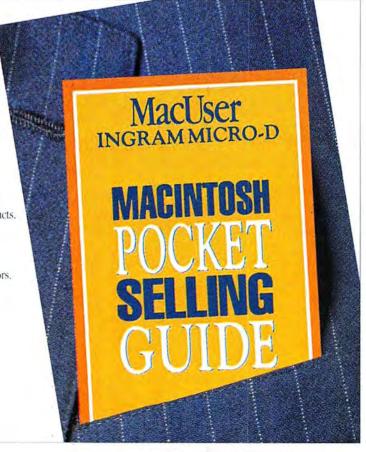
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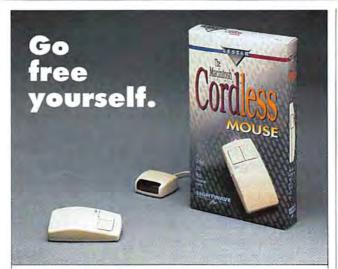
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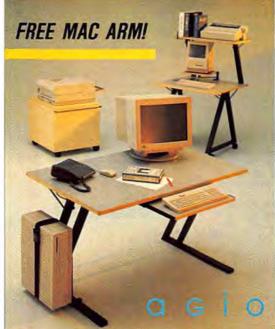
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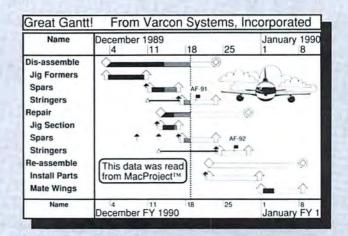
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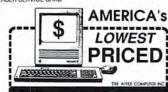
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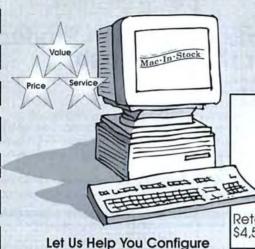
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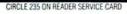
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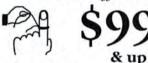
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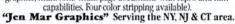
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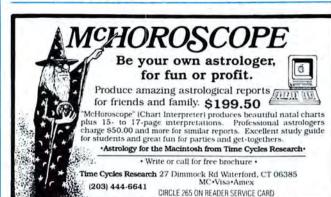
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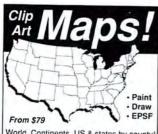


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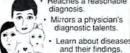
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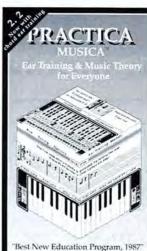
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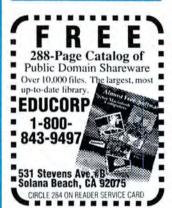
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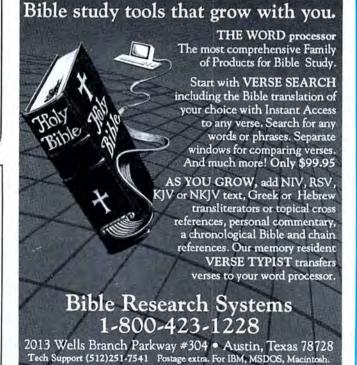
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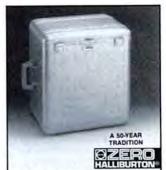
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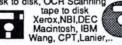
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I've seen one type of character over and over who, to me, epitomizes the typical dog-of-an-employee in a slimeball company. His name is usually something like Benjamin "Buddy" Knudsen (any relationship to any real Benjamin "Buddy" Knudsen is purely coincidental). I had the opportunity to interview him just last week.

Dvorak: Hello, Mr. Knudsen. May I call you Buddy? Knudsen: OK, pal, I think you're a swell guy too, buddy. Dvorak: No, I mean like your nickname, "Buddy."

Knudsen: Actually that's my real middle name — my friends call me Ben.

Dvorak: So. Ben. when did you get into computers? **Knudsen:** Who did you say this was an interview for? **Dvorak:** *MacUser*.

Knudsen: Oh yes. I think I've heard of it. A newsletter? Are you selling ads? Do I have to pay to be interviewed or what?

Dvorak: No, it's a magazine. You've never heard of it? What Mac magazine or newsletter do you read?

Knudsen: Oh, let's see. I read BusinessWeek, usually on a plane, and The Wall Street Journal, and I even read Black Enterprise. In fact, I'm pretty well-read from what I can tell in this industry. So what do you do at MacUser? You said it was a magazine, right? Do you sell ads?

Dvorak: No, I'm a columnist. The back page of the magazine — you should check it out.

Knudsen: A columnist?! Really? I've always wanted to be a columnist. Who do I talk to at *MacUser* to write a column?

It was then that I pulled out a sawed-off shotgun that I keep in my Mac Portable case and cut the poor guy in half by emptying two rounds of buckshot into him at close range. Earlier that day, by coincidence, I had purchased a Saturday Night Special from Krazy Khadaffi's Gun Shop and Massage Parlor and registered it under the name of J. W. Booth. I slipped the cheap pistol into the guy's hand (just like I'm told cops like to do in certain circumstances) and figured that someone else could make the Booth connection. I'd later tell the coppers that

it all seemed pretty suspicious to me.

Once the police discovered that Knudsen was a marketing man in the computer industry, they laughed heartily and told me not to worry. This happens all the time, I was told. "We'll call it justifiable homicide if you like. Whatever the case, we'll have him dumped into the pauper's pit where they throw all the marketing types," said Sergeant O'Reilly as he tossed the two halves of Knudsen into his trunk while shooing away a curious pit bull that had showed up mysteriously.

The dog got a whiff of the marketing man and sneezed. The dog then threw back its head, growled for a moment, and walked off in a huff.

I guess this episode reflects why I don't care to talk to marketing people. Even dogs have their doubts about them.

One of the interesting things about writing a widely read column is that I'm often approached by PR people who invite me to lunch or dinner with a new director of marketing for some small software company I've never heard of. The invitation is usually presented as some sort of opportunity for me to bask in the presence of the Great One: Francis X. Schmuck, V.P. of Marketing for Krum-Bum Software.

I'm always amused by these invites because they invariably begin with "Mr. Schmuck can fit you in for a 1:30 appointment on Thursday." I say I can't make it and a progression begins: "There's 11 A.M. available." "What about noon?" "What time do you have open?" "Look. He has the whole day open for you." "The whole week." "He's flying to California just to see you."

Maybe I'm too harsh on these guys, but face it — they aren't the people who really make a difference in this industry. It's the engineers and the programmers and the visionaries and just about anyone but the marketing guys who make a difference.

If I do agree to have lunch with the marketing guy, I find that nine out of ten of these meetings include a PR woman (or two) who tells this joker what to say to me. If I ask the most mundane question, I encounter blank stares:

"Maybe Bert Jenkins, the head of programming, can answer that. What do you think, Mr. Schmuck?"

"Yeah, yeah, Bert might know."

OK, great. But why doesn't Bert get to go to lunch? He can't; he's at the plant doing the real work! That thought kind of wakes me up. In fact, it did! And I found myself still listening to my friend Buddy Knudsen.

"... so I first got started in the desktop computer scene in 1986. I guess that makes me something of an old-timer, right? Before I got involved in the computer game, I was an account

executive at a big New York ad agency—that's where I got introduced to computers. One of my accounts was a company that made simulated-walnut computer stands. That was back, golly, all the way back in '85, I think. I read a couple of Peter McWilliams' books—you know, the ones about word processing — and pretty soon I was the resident computer expert. So. . . how do I write a column?"

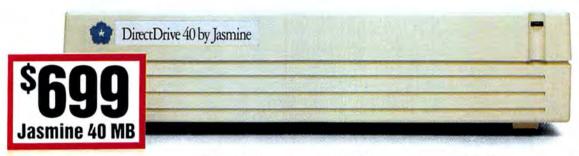
I reached for the shotgun, before realizing that I've never owned one — damn!



By John C. Dvorak

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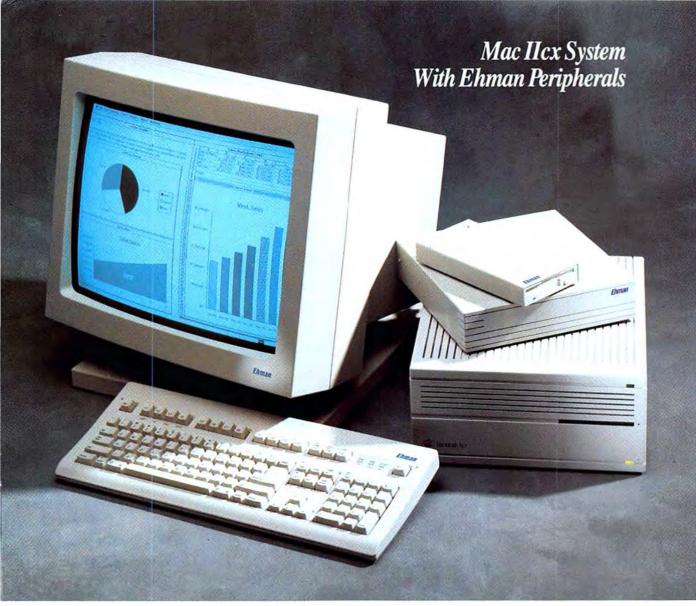
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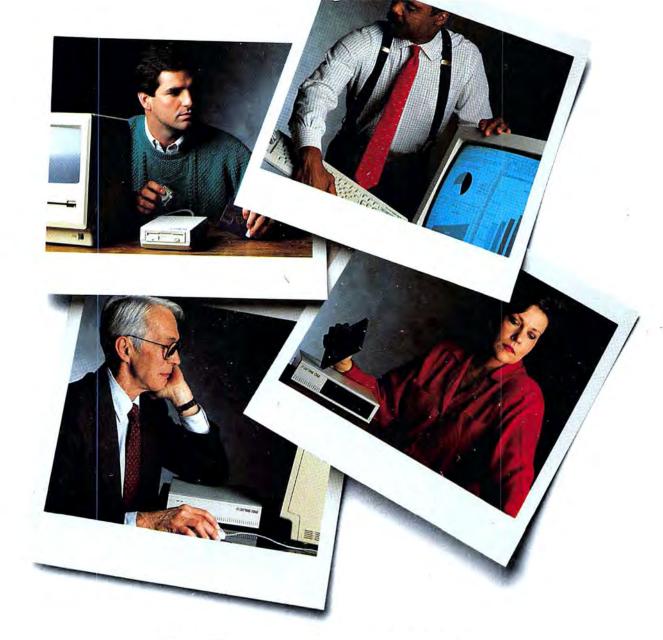
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